

HORSE HEALTH





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HORSE HEALTH



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(Parasites and Pests)

Alberta
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Horse Health

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INTRODUCTION

Often the owner knows the horse better than anyone else. You should, therefore, have the best understanding of what is normal for your horse. When you are thoroughly familiar with what is normal it is easier to recognize what is abnormal. Keep your horse healthy by taking proper preventive measures and learning to recognize early signs of disease. Know when to seek professional advice about a problem. Early diagnosis often gives the best result in treating health problems. The more knowledgeable you become, the more you will appreciate veterinary services. Horse health problems can be very complex and difficult to pinpoint.

How to Examine Your Horse

Overall Impression

Examine your horse by standing back and gaining an overall impression. The horse should be responsive to its surroundings and show this by being alert with its eyes wide open and its ears constantly moving to and fro. A horse normally distributes its full weight evenly on both front legs. Both hind legs may also bear full weight or may be rested alternately.

The horse should not appear listless. It should notice movements or noises around it. If the horse often stands off by itself, this may warrant further examination for a health problem. Look for obvious injuries, wounds, scrapes or types of unsoundness. Note any abnormal posture or unwillingness to move.

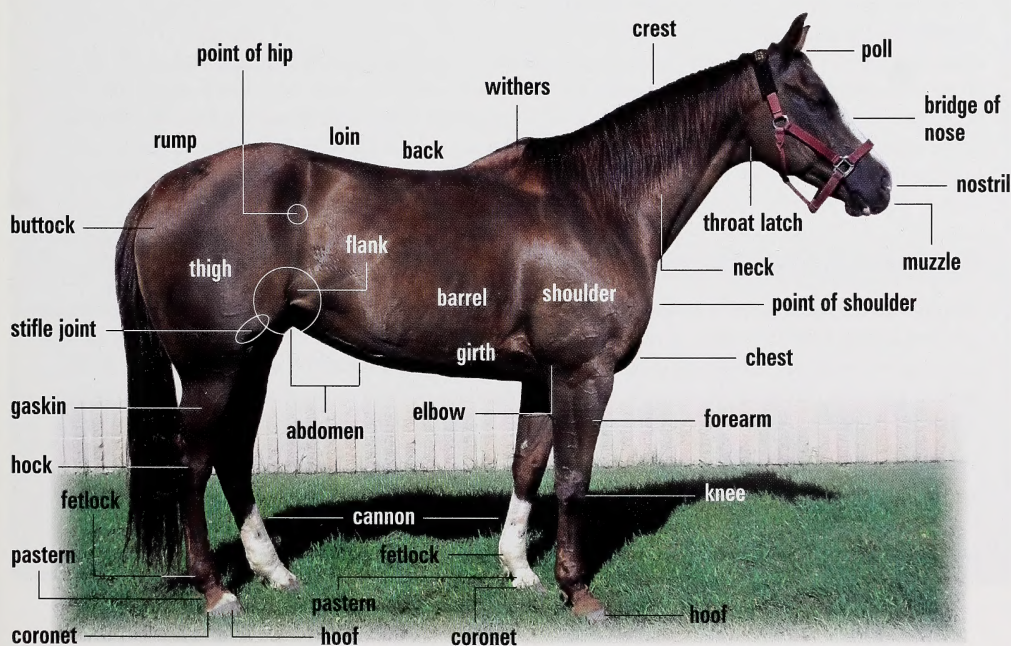


Figure 1.
Parts of a horse.

Hair Coat

Notice the hair coat. During the summer, it should be bright and slick with a gloss from the natural body oils. The winter hair coat should be thick and uniform. In winter, the coat will not be as bright but it should appear to have a glossy tinge. A horse that has patches of missing hair or a dull, dry hair coat warrants investigation.

Body Condition

Next, notice the horse's condition. Is it too fat or too thin? Excessively fat horses may be prone to developing laminitis. Excessively thin horses may be ill, heavily parasitized, underfed or have dental problems. As a rough guide, the ribs of a horse that is carrying the right amount of fat are easily felt but not seen. Feeling for the ribs is especially important in the winter. A long, thick winter hair coat may disguise a thin horse.

Table 1
Ideal
condition
scores for
breeding
stock and
performance
horses

Breeding Stock

Mares

Non-Lactating (mares without foals)

Research has demonstrated that the reproductive performance of non-lactating mares is best when they are maintained at a condition score of 5 or more. Establishing and maintaining pregnancy becomes increasingly more difficult when the condition score of mares drops below this level.

Lactating (mares with foals)

It is very difficult for mares to gain weight when nursing. They simply cannot eat enough. Most mares will experience a small to moderate weight loss. To ensure mares are at a condition score of 5 or more at the time of rebreeding, they should foal at a condition score of more than 6. This degree of body fatness should be established during the first eight months of pregnancy, since digestive capacity is considerably reduced during the last trimester.

Note: Recent research has shown that obesity (condition score 9) is not detrimental to reproductive performance and does not increase foaling difficulty. This degree of body fatness, however, severely limits a horse's performance capability and is considered unhealthy.

Stallions

Research has not demonstrated a relationship between reproductive performance and condition score in stallions. However, an extremely thin (condition score less than 2) or an extremely fat (condition score more than 8) condition would be unhealthy. Some stallions are quite active during the breeding season. As a result, they lose a considerable amount of weight. For these stallions, establishing a high degree of body fatness (condition score 6 or 7) before the breeding season would ensure that they would not become too thin during the breeding season.

Performance Horses

The optimum condition score for performance horses depends on the type of activity. More strenuous and demanding activities, such as racing and endurance riding, require a very high degree of fitness and thus less body fat. Horses in these activities are usually at a condition score of 3 or 4. Activities such as pleasure riding are less strenuous and demanding. Horses in these activities require only a moderate degree of fitness and thus carry more body fat. Condition scores may range from 4 to 7.

Note: Optimum condition scores for breeding stock or performance horses will vary from breed to breed. The metabolism of hot-blooded horses (Thoroughbreds, Standardbreds, etc.) is greater than cold-blooded horses (Quarterhorses, draft horses, Shetland ponies, etc.). As a result, the optimum condition scores listed above may be one-half to one condition score less for hot-blooded horses.

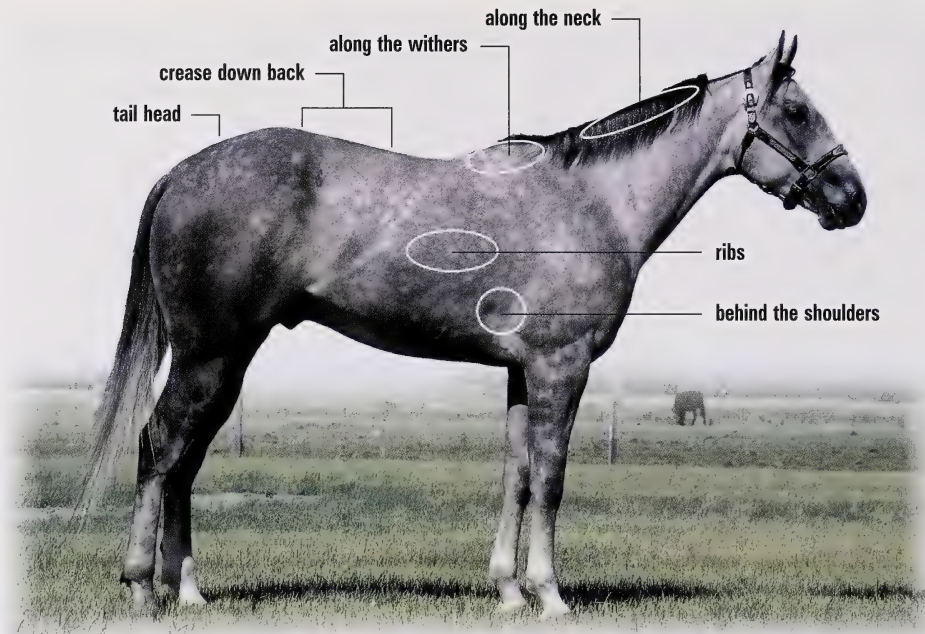
Score Description

1	Poor. Animal extremely emaciated. Spinous processes, ribs, tailhead and hooks and pins projecting prominently. Bone structure of the withers, shoulders and neck easily noticeable. No fatty tissues can be felt.
2	Very Thin. Animal emaciated. Slight fat covering over the base of spinous processes, transverse processes of lumbar vertebrae feel rounded. Spinous processes, ribs, tailhead and hooks and pins prominent. Withers, shoulders and neck structures faintly discernable.
3	Thin. Fat built up about halfway on spinous processes, transverse processes cannot be felt. Slight fat over ribs. Spinous processes and ribs easily discernable. Tailhead prominent, but individual vertebrae cannot be visually identified. Hook bones appear rounded, but easily discernable. Pin bones not distinguishable. Withers, shoulders and neck accentuated.
4	Moderately Thin. Negative crease along back. Faint outline of ribs discernable. Tailhead prominence depends on conformation, fat can be felt around it. Hook bones not discernable. Withers shoulder and neck not obviously thin.
5	Moderate. Back level. Ribs cannot be distinguished but can be easily felt. Fat around tailhead beginning to feel spongy. Withers appear rounded over spinous processes. Shoulders and neck blend smoothly into body.
6	Moderate to Fleshy. May have slight crease down back. Fat over ribs feels spongy. Fat around tailhead feels soft. Fat beginning to be deposited along the sides of the withers, behind the shoulders and along the sides of the neck.
7	Fleshy. May have crease down back. Individual ribs can be felt, but noticeable filling between ribs with fat. Fat around tailhead is soft. Fat deposited along withers, behind shoulders and along the neck.
8	Fat. Crease down back. Difficult to feel ribs. Fat around tailhead very soft. Area along withers filled with fat. Area behind shoulder filled in flush. Noticeable thickening of neck. Fat deposited along inner buttocks.
9	Extremely Fat. Obvious crease down back. Patchy fat appearing over ribs. Bulging fat around tailhead, along withers, behind shoulders and along neck. Fat along inner buttocks may rub together. Flank filled in flush.

Table 2 Horse condition score system¹

¹ Modified from:
Henneke, D.R., G.D.
Potter, J.L. Kreider, and
B.F. Yeates. *Relationship
Between Condition
Score, Physical
Measurements and
Body Fat Percentage in
Mares*. Eq. Vet J.
15:371-372, 1983.

Figure 2.
Areas emphasized in
the condition score
system.



Eating Behaviour and Manure

Watch for any unusual eating behaviour. When chewing, the horse should not drop feed from its mouth and it should look very comfortable. Horses eat large volumes of plant material – consequently they spend much of their time chewing. This large intake volume produces large volumes of manure. Be observant, notice both the volume of manure and its consistency. Horses pass manure several times daily. It should be firm but not hard. Normally, it will be formed into balls that break upon hitting the ground.

Eyes

Check the eyes for any discharge. Make sure the eyes are bright, clear and held completely open. Experienced horsemen always watch a horse's eyes to determine its behaviour and awareness. Watching the eyes also gives you a clue as to how the horse is feeling. Dull, sunken eyes may indicate that the horse has not been receiving or retaining sufficient water. Dehydration in the presence of an adequate water intake is a sign of severe disease.

Nostrils

A horse's nostrils should be clean, free of any discharge and slightly moist. In a horse at rest, the nostrils should flare slightly on each inspiration. An equal volume of air should move freely and noiselessly through each nostril and there should be no foul odour to the breath.

Oral Examination

An oral examination can be used to examine the colour of the oral mucous membranes (gums), to determine the health of the tongue and to examine the teeth (both incisors and molars) for any abnormal wear patterns. A normal tongue is pink, moist, soft and pliable. The elongated part of the tongue ahead of the molar teeth is freely mobile. A horse's oral mucous membranes should be moist and pale pink. Thumb pressure on the mucous membrane adjacent to the roots of the incisor teeth will blanch the pink colour to white. Measurement of the time taken for this colour to return is known as the capillary refill time (CRT). This is a valuable indicator of the status of the horse's circulatory system. With a normal horse the CRT is 1 to 2 seconds, for moderately ill horses 3 to 4 seconds and for horses in severe shock 5 to 6 seconds.

When examining the molar teeth you may find wear abnormalities that may be interfering with proper chewing. Flush any food from the mouth to allow you to examine the molars. Be very careful because a horse can exert a great crushing force between its molars. Even an experienced person may be bitten.

Head Examination

View the horse's head from in front to ensure that it is symmetrical from side to side. Any deviation from this symmetry may indicate nerve paralysis, fractured bones, or swellings caused by injury, infection or tumours.

Abscesses are a common cause of swelling in the throat latch area and between the mandibles (jaw bones) ahead of the throat latch. In many cases, abscesses in this region may be a sign of strangles.

Respiration

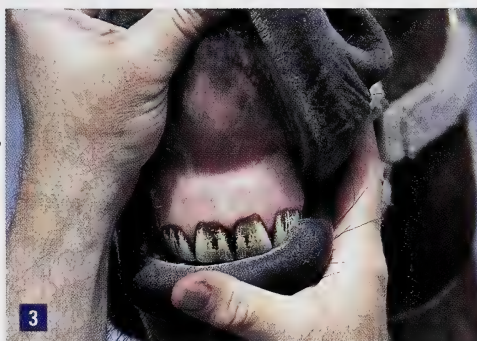
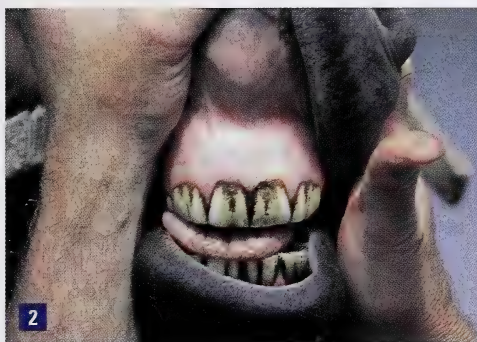
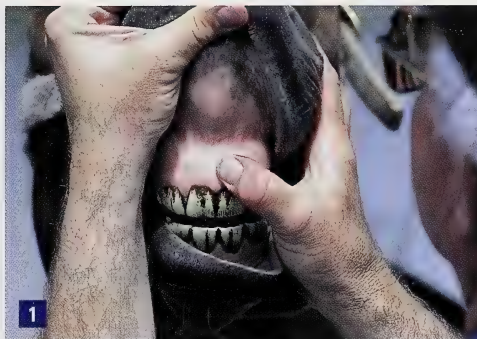
Normal resting respirations consist of a subtle in-and-out movement in the lower flank area followed by a pause. To count the respiratory rate, watch the horse's flank area. In a quiet resting adult, it should be 10 to 12 breaths per minute. Respiratory rates that are greater than the heart rate may indicate exhaustion in a competition horse.

Genitalia

Next, check the external genitalia of the horse for any abnormalities such as swelling or discharge of blood or pus.

Legs

Examine the horse's limbs by touch, look for wounds, swelling, heat or pain. When you have doubt about the condition of a leg, it is helpful to compare it to the opposite leg. The two should be mirror images of each other.



Mark Vitaris Productions for Alberta Agriculture

Figure 3.
Capillary refill time (CRT) is a valuable indicator of the status of a horse's circulatory system.

1. Apply thumb pressure.
2. Pressed area turns white.
3. Measure the time it takes to turn pink again.

Figure 4.

The facial artery is the most commonly used artery for taking a horse's pulse.



Sharp Shooter Photographics for Alberta Agriculture

Pulse

Several superficial arteries may be used to take a horse's pulse. The facial artery where it curves around the mandible just in front of the masseter muscle is most commonly used. You can also take the heart rate just behind the left elbow by placing your hand on this area and feeling the heart beat or by listening to it with a stethoscope. A horse's normal heart rate at rest is 36 to 48 beats per minute (bpm). This can vary considerably with the horse's conditioning and degree of excitement. Normal heart rate for a foal is 40 to 60 bpm. A resting heart rate more than 60 bpm in an adult usually indicates pain or illness.

Feet

The bottom of the feet should be cleaned and examined frequently. Remove stones and manure as they may cause discomfort or contribute to disease. Cleaning will allow you to examine the sole. You should note any black or draining areas, or sore or soft areas in the sole.

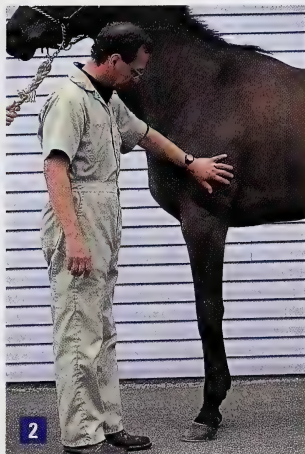
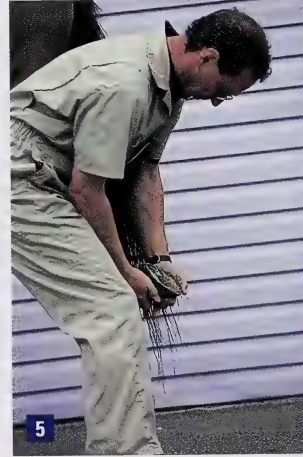
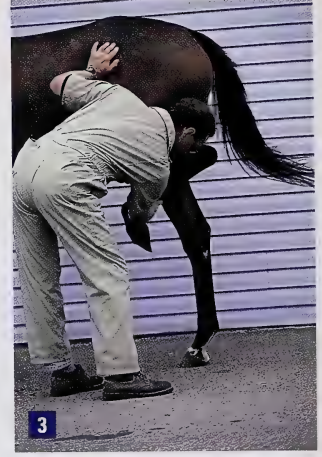


Figure 5.
How to lift a front foot.

1. Stand next to the horse facing the rear. Put your hand that is nearest the horse on its shoulder.
2. Move your hand down toward the leg so the horse is not startled when you pick up the leg.
3. Run your hand down the back of the leg.
4. Continue down the leg with a light, but firm grip.
5. Get the horse to lift its foot by pressing back and up on the back of the pastern. Grip and pull if the horse does not lift its foot.
6. Raise the foot.
7. When the foot is up, support it with your hand around the hoof wall.
8. Tilt the sole up to examine and clean the bottom of the foot.

Figure 6.
How to lift a hind foot.

1. Stand near the horse facing the rear. It is difficult for the horse to kick you in this position. Run your hand down its hindquarters.
2. Run your hand down the back of the leg and pull up and forward.
3. Lift the foot but do not hold it too high or the horse may lose its balance. Keep your inside hand on the hip so you can feel what the horse is doing and you can push it away from you if it becomes upset.
4. Place your inside arm over the hock and step under the leg, pulling it slightly to the rear of the horse. The leg can then be supported by your inside leg while you work on the foot.
5. Put your hands around the hoof to hold the foot steady.
6. Hold the foot steady while you check the foot and clean it. Clean the grooves of the frog first, then the sole. Always work the pick toward the toes so it won't damage the frog or the leg if it slips.



INTERNAL PARASITES

Parasitic problems are very common in horses. Young horses especially are susceptible to all types of parasites.

The effect of parasitism on the horse is not always obvious. Unthriftiness, poor food utilization, pot belly, persistent cough, anemia, diarrhea and colic are a few signs associated with various parasitic infections.

In most cases, horses become infected by eating worm eggs or infective larvae passed in manure. Keeping horses on small crowded pastures or giving them supplemental feed on the ground favour the transmission of parasitic infection.

Horses on a good parasite control program will normally require less feed and be in better body condition than those on inadequate control programs. They will likely have fewer parasite-related problems.

Management methods that keep infestation levels down

- Don't overcrowd or overgraze pastures. Given enough room, horses tend to divide a pasture into the "rough" where they defecate and the "lawn" where they graze.
- Rotate pastures. Keep horses off contaminated pastures for up to one year to reduce contamination with parasite eggs and larvae. Ascarid eggs survive for longer time periods.
- Graze cattle or sheep on horse pastures. Most horse parasites will not complete their life cycle in these species. The parasite eggs and infective larvae ingested by cattle and sheep will be removed from the pasture.
- Feed horses in bunks and troughs instead of on the ground to prevent them eating in the same place as they defecate.
- Allow horse manure from stalls and barns to rot for at least one year before spreading it on pasture land. This will kill most of the parasites present in the manure.
- Pick up manure from pastures twice weekly and store it in a compost pile before returning it to pasture. This is a labour intensive practice but is a very effective parasite control method and is especially useful for owners with small pastures.
- Deworm all horses before turning them onto a clean pasture to prevent contaminating the pasture.
- Harrow pastures before dry seasons to break up manure piles and expose the parasites to drying by the sun. Caution – this will spread parasites from the areas of roughs onto lawns and make them more readily accessible to grazing horses. Do not graze horses in these pastures for several weeks after harrowing.

- Deworm with effective dewormers (anthelmintics). The frequency depends on other management practices. This is a very important part of a parasite control program but should not be the only measure that is used. Dewormers remove adult parasites from the gut of the horse. This stops the harmful effects of the adults as well as destroying their egg-laying capabilities, which decreases the parasite burden in the horse's environment.

Deworming Program

Oral administration of a paste or liquid formulation is the most common method of deworming. This method is satisfactory if administered properly so the horse does not spit it out. There are several other methods to administer dewormers. Check with a veterinarian if you feel you need to consider an alternative application method.

The frequency of deworming can vary according to each owner's and horse's situation. Because of the short life cycle of ascarids and the damage that can be done to foals by the large strongyles, deworm them at 6 to 8 weeks of age and then every 6 to 8 weeks until two years of age. Older horses confined in small, overcrowded pastures can also benefit from being dewormed every 6 to 8 weeks in an effort to keep the parasite burden within the horse and its environment to low

levels. If it is necessary to reduce the frequency of deworming because of expense and difficulty in handling, try a seasonal deworming program. Deworm in April and June to curtail the spring and summer increases in parasite egg production and again in October to kill bots and intestinal parasites acquired from contaminated pastures during summer grazing.

A general recommendation is to use ivermectin or moxidectin for each treatment during the year. (According to observations to date, moxidectin appears to have a higher efficacy against encysted small strongyles.) At the present time, the only parasites that have developed resistance to dewormers are the "benzimidazole-resistant" small strongyles.

To ensure you have an effective deworming program:

- Administer the correct amount of dewormer based on an accurate estimation of the horse's weight. **Do not under-dose.**
- Use a dewormer that is effective against the parasites infesting the horse.
- Make sure the dewormer is consumed or retained when administered.
- Administer the dewormer at frequent enough intervals to keep the parasite burden as low as possible. **Consult a veterinarian about the type of dewormer and the frequency of administration.**
- Keep accurate records to help you maintain the proper frequency of deworming.
- **Monitor the effectiveness of your program through regular fecal exams.**



Sharp Shooter Photographics for Alberta Agriculture

Figure 7.
Oral administration of a paste or liquid formulation is the most common method of deworming.

Table 3
Internal
parasites of
horses

Parasite	Damage	Signs	Diagnosis and Prevention
Stomach Bots Bots are commonly found in horses grazed outside during the warmer months. Two of the three species known to occur in horses (<i>Gasterophilus intestinalis</i> and <i>G. nasalis</i>) are usually found as mixed infections in Alberta. All three have similar life cycles, although the method of infection differs somewhat between the species.	Bot larvae in a horse's stomach can cause mechanical blockage of the stomach, colic or rupture of the stomach wall.	Loss of condition, poor coat, lack of appetite and intestinal pain are some of the signs associated with bot infestations. However, the signs are not specific to bots. Various worm infections may produce similar signs. Bots may be seen during late spring attached to the anus or passed in manure.	Manure samples are of little use because no eggs are produced to indicate infections. Horses kept on pastures and exposed to botflies are assumed to be infected and should be dewormed early fall after the first killing frost. Diagnosis is confirmed by finding bots in the stomach during necropsy (autopsy).
Large Strongyles The group known as large strongyles contains three important species, <i>Strongylus edentatus</i> , <i>S. equinus</i> , and <i>S. vulgaris</i> . They feed on blood and tissue, and cause more damage than the small strongyles because they migrate through various organs during their development.	<i>S. vulgaris</i> , the most pathogenic, is a large worm ranging from 2.5 to 5 cm (1 - 2 in.) in length. Foals previously exposed to a few <i>S. vulgaris</i> develop a partial resistance to reinfection. Foals not previously exposed may become overwhelmed by a severe infestation, resulting in the death of the animal in 2 to 3 weeks. Most of the damage is done by migrating larvae which may cause blockage and weakening of the blood vessels.	Diarrhea, moderate anemia, loss of appetite, depression, loss of body weight, poor coat, and poor performance may be observed but these signs are not specific to strongyle infections. Naturally infected horses normally carry a mixed burden of large and small strongyles making it difficult to identify specific infections.	Fresh manure samples are examined in the laboratory for strongyle eggs. Their absence in the manure does not eliminate the possibility of infection because strongyles migrate through the horse for 6 to 8 months before producing eggs that can be detected in the manure. The migrating larvae may cause much damage during this time.

Table 3
Internal
parasites of
horses
 (continued)

Parasite	Damage	Signs	Diagnosis and Prevention
Small Strongyles (Cyathostomes) This smaller non-migrating group, contains numerous species. They cause less damage than large strongyles because they remain in the gut during their development and they have smaller "mouths". Like large strongyles, they feed on blood and tissue.	Movement of larvae into and out of the intestinal wall causes severe inflammation. Adults in the intestine feed on plugs of intestinal lining. Damage may lead to ulceration.	Diarrhea, weight loss and colic may be observed but are not specific to small strongyle infections.	Eggs pass out in the feces. They cannot be differentiated from large strongyle eggs in a routine fecal exam. Usually more than 95 per cent of the strongyle eggs in a sample are from small strongyles.
Ascarids (<i>Parascaris equorum</i>) Adult large ascarids live in the small intestine and grow to be 15 to 50 cm (6 - 20 in.) long. They are more commonly found in young horses (less than two years old), as older horses develop a resistance to infection. Eggs are very resistant to environmental extremes and may remain viable for several years. Hence, heavily infected foals of one year may contaminate an area with eggs to infect next year's foals, or even foals born in subsequent years.	The severity will depend on the number of worms present. Large numbers of adult worms may cause intestinal blockage. Migrating larvae may cause liver, lung, or intestinal damage. Secondary infection of the lungs may occur. Poor weight gain is also common in foals infected with <i>P. equorum</i> .	<p>The period of larval migration through the lungs may be characterized by coughing and mucus discharge through the nose. Diarrhea, unthriftiness, dullness, rough coat, reduced food intake, liver damage, and intestinal obstruction may accompany infection with this worm.</p> <p>The adult phase of the parasite is better tolerated and foals may only show signs of dullness, emaciation and weight loss. Have a veterinarian examine your horse when any of these signs appear. If they suspect ascarids, they will examine a fresh manure sample in the laboratory for their characteristic eggs.</p>	Stalls should be cleaned of manure weekly to prevent the accumulation of eggs containing infective larvae. Feed should be provided in feeders raised off the ground. It is difficult to prevent infection with <i>P. equorum</i> because so many highly resistant eggs are produced. However, the effects can be minimized by treating foals with anthelmintics from six weeks of age onwards. This will prevent the build up of large numbers of worms and avoid the risk of fatal obstruction of the intestine with a mass of dead worms when heavily infected foals are treated.

Table 3
Internal
parasites of
horses

(continued)

Parasite	Damage	Signs	Diagnosis and Prevention
Threadworms <i>(Strongyloides westeri</i> and <i>S. papillosus)</i> Adult threadworms inhabit the small intestine of horses.	<i>Strongyloides westeri</i> , the most common threadworm, appears to be of little importance, but may cause persistent diarrhea in foals under four months of age.	Infected foals may have diarrhea but severe problems rarely occur. Large numbers of worms may be found in foals but older horses develop a resistance to them.	Since larvae are passed to the foal in the mare's milk, deworming the mare just before foaling may reduce the foal's infestation.
Stomach Worms <i>(Habronema spp.</i> and <i>Draschia spp.)</i> These are small worms, approximately 2.5 cm (1 in.) long, that live attached to the stomach wall.	A few adults cause no obvious signs but hundreds of worms may produce digestive disturbance, inflammation of the stomach, or even ulceration. Larvae deposited by flies in skin wounds cause a local inflammation and a condition known as summer sores.	Infected horses may show poor condition, rough coat, and a depressed appetite. Infections are difficult to distinguish from several other parasites such as bots and strongyles. A veterinarian should be consulted.	Removal and careful disposal of horse manure, and control of flies is necessary. Skin wounds should be treated to promote healing and should be protected from flies. This conditions is very rare in Alberta.
Pinworms <i>(Oxyuris equi)</i> When seen, they often indicate the presence of other intestinal parasites. They live in the large intestine with females migrating to the rectum to lay eggs.	Pinworms are common in horses in Alberta causing little harm, but are often noticed. Egg laying causes itching in the rectum.	Horses heavily infected with pinworms tend to rub their hind ends resulting in hair loss from the tail and abrasions.	Look for whitish-yellow eggs around the anal region. Most broad spectrum anthelmintics recommended for strongyles are effective against pinworms.
Lungworms <i>(Dictyocaulus arnfieldi)</i> Lungworms are occasionally found in the air passages of horses. Although all equines are susceptible, donkeys appear to be the normal host.	Lungworms may cause coughing and inflammation of the lungs, but generally they are not considered very pathogenic.	Infection with this parasite is often suspected in horses with a chronic cough, particularly if they are known to have grazed with donkeys.	Mature horses with no prior exposure to lungworms are susceptible to infection but the worms do not develop to maturity and hence are difficult to diagnose.

Table 3
Internal
parasites of
horses
(continued)

Parasite	Damage	Signs	Diagnosis and Prevention
Tapeworms Tapeworm infections in horses are not common in Alberta. Although two species (<i>Anoplocephala perfoliata</i> and <i>A. magna</i>) are recorded from horses in Canada, few attempts have been made to determine their distribution and prevalence.	Heavy infections may cause intestinal obstruction. Free-living mites, which eat the eggs of the tapeworm, are the intermediate hosts. Horses become infected on ingesting infected mites with herbage. Infections are usually associated with older pastures where a good ground mat facilitates the development of a large mite population.	May be a cause of colic.	Diagnosed during intestinal surgery or at autopsy. Consult your veterinarian about treatment for tapeworms.

Figure 8.
Stomach bots
life cycle.

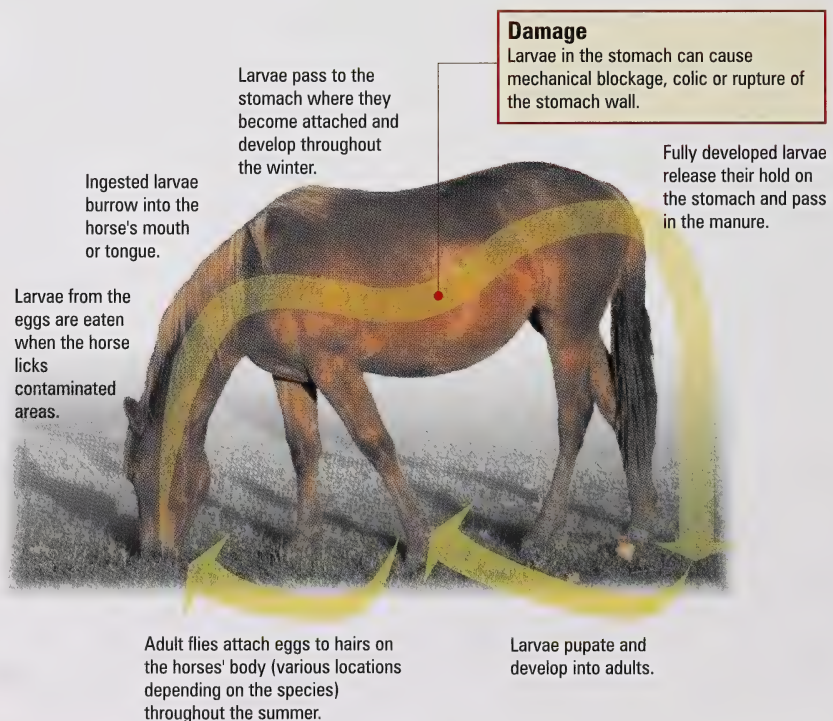


Table 4
Life cycles
of internal
parasites of
horses

Parasite	Life Cycle
Stomach Bots	<p>Adult flies attach eggs to the hairs of horse throughout the summer months. Attachment sites vary with the species. Larvae hatching from the eggs are either eaten when the horse licks contaminated areas, or migrate to the mouth and pass between the lips. Ingested larvae burrow into the horse's mouth or tongue and develop for 21 to 28 days before passing to the stomach where they become attached and develop throughout the winter. The larvae (bots) are nearly one inch long when fully developed in 10 to 12 months. Fully developed larvae release their hold on the stomach and pass in the manure. Passed larvae burrow into the ground, change into pupae, and emerge as adult flies in 2 to 3 weeks.</p> <p>The common botfly (<i>Gasterophilus intestinalis</i>) deposits light yellow eggs on the hairs of the forelegs, belly, flanks, and shoulders; the nose botfly (<i>G. haemorrhoidalis</i>) attaches black eggs to the hairs of the lips; and the throat botfly (<i>G. nasalis</i>) attaches light yellow eggs to the hairs of the throat. The eggs of <i>G. nasalis</i> hatch naturally, independent of external moisture and without any pressure or friction being applied by the host, and crawl over the skin to enter the mouth through the lips. In contrast, hatching of eggs of <i>G. intestinalis</i> is stimulated by warmth, moisture, and friction, and infection occurs when the lips of the horse contact the egg-bearing hairs.</p>
Large Strongyles	<p>Adult female <i>S. vulgaris</i> lay eggs that pass out in the manure. On the ground, the eggs develop into infective larvae that hatch and climb onto grass and remain there until eaten. Ingested larvae penetrate the intestinal wall and enter arteries supplying blood to the intestine. They may migrate to many arteries but tend to favour those supplying blood to the small and large intestine. They remain in the arteries for several months before returning to the intestine where they develop into adults.</p> <p>The life cycle of <i>S. edentatus</i> is similar to <i>S. vulgaris</i> except that the larvae do not migrate through the arteries, but rather migrate intravenously to the liver where they feed and grow for several months before re-entering the intestine. Migrating larvae may also be found in the body cavity and in nodules in the intestinal wall.</p>
Small Strongyles (Cyathostomes)	<p>Adult females in the intestine lay eggs that pass out in the manure. On the ground, the eggs develop into infective larvae that hatch and climb onto grass and remain there until eaten by the horse. Ingested larvae enter the wall of the large intestine and become encysted there for 1 to 2 months (sometimes as long as 30 months). The larvae leave the intestinal wall and develop into adults in the intestine. These adults lay eggs to start the cycle over again.</p>

Table 4
Life cycles
of internal
parasites of
horses
 (continued)

Parasite	Life Cycle
Ascarids	Adult worms in the small intestine lay eggs that pass out with the manure. Infective larvae develop within the eggs in about two weeks but do not hatch until swallowed by a grazing horse. Most foals acquire an infection during the first few weeks of life when they are most susceptible to the parasite. On hatching, larvae penetrate the wall of the intestine and are carried by the blood stream to the liver where they migrate for a short time before proceeding to the lungs. On reaching the lungs, they leave the bloodstream, enter air passages, pass up the trachea and are swallowed, eventually ending up in the small intestine where they mature in about two months. One female may produce 200,000 eggs per day amounting to millions of eggs per day in heavy infections.
Threadworms	Only females are parasitic. Eggs containing larvae are laid in the small intestine and passed out in the manure and hatch. Foals may begin passing eggs as early as two weeks of age. On the ground, larvae develop to the infective stage in about two days. Horses become infected by larvae penetrating the skin of the host. On penetrating, larvae enter the circulatory system and are carried to the lungs. They enter respiratory channels, migrate up the trachea, and are swallowed. After reaching the intestine, they mature, and produce eggs in 8 to 14 days after infection. If infective larvae are ingested by the horse, they enter the intestine without undergoing tracheal migration. Infection in foals appear to originate mainly from larvae passed in the milk of mares. Larvae first appear in the milk approximately four days prior to foaling and are passed during the first seven days of lactation. Some larvae passed in the manure develop into free-living adults which in turn produce infective larvae. These larvae may infect horses as described above but are generally not regarded as the primary source of infection.
Stomach Worms	Two hosts are required in the life cycle of stomach worms. Larvae hatch from eggs before or soon after being passed in the manure. Various species of house and stable flies also lay eggs in the manure. Maggots (fly larvae) hatch from the eggs and eat the stomach worm larvae. The larval stage develops within the insect and reaches the infective stage by the time the adult fly stage has developed. Horses become infected when they accidentally eat infected flies or maggots with feed or while nipping at hair. Parasite larvae may also pass through the mouthparts of the adult fly when it feeds around the lip of the horse, or into open wounds. Larvae that are swallowed develop to maturity in the stomach, while those deposited in wounds remain there but do not develop further.
Pinworms	Adult worms 1 to 2.5 cm (0.5 to 6 in.) long are found throughout the large intestine where they feed on intestinal contents. Females migrate to the anus to deposit their eggs which fall to the ground and contaminate food, water, and bedding. Infective larvae develop within eggs in about one week, and when eaten, hatch and migrate to the large intestine where they mature in 4 to 5 months.

Figure 9.
Strongyles life cycle.

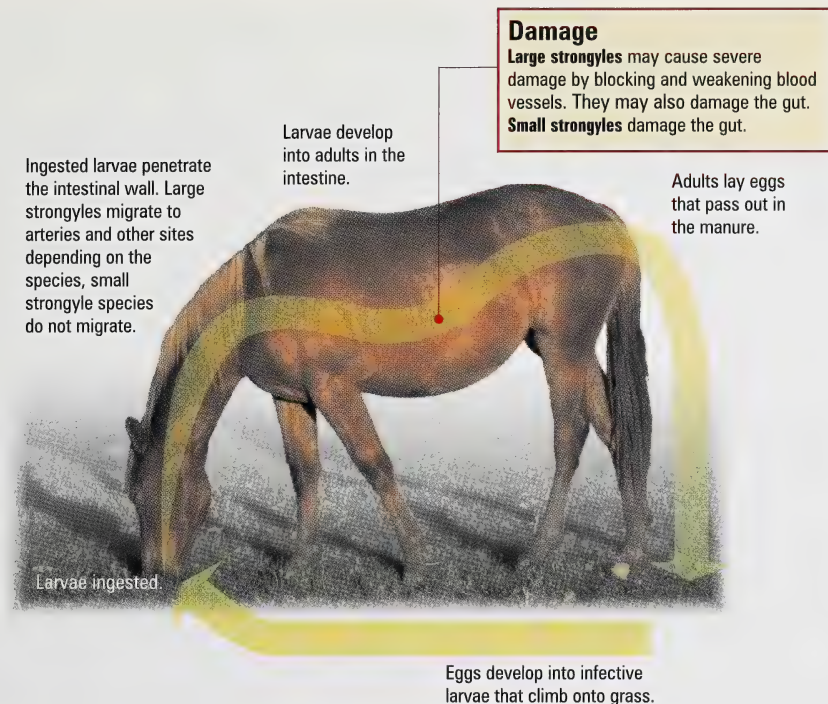
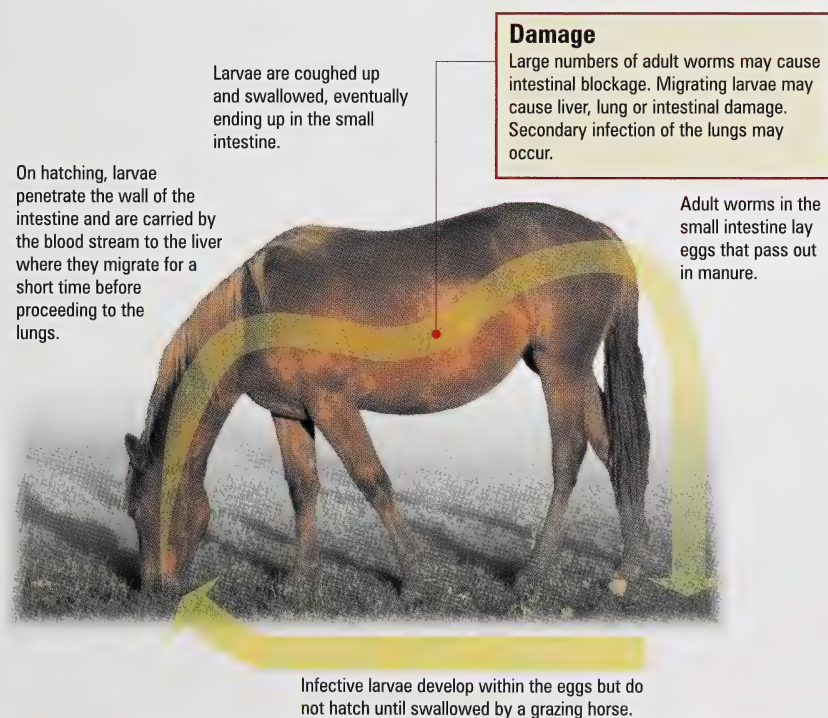


Figure 10.
Ascarids life cycle.



EXTERNAL PARASITES & PESTS

A variety of parasites and pests affect the well-being of horses. External parasites complete their life cycle on the horse

feeding on blood, secretions, or sloughed skin. Pests feed on the horse's blood or external secretions but do not remain on the horse.

Table 6
External
parasites of
horses


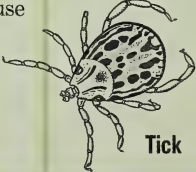
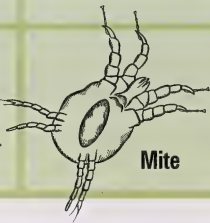
Parasite	Damage	Signs	Treatment
<p>Lice</p> <p>Horses may be infested with either sucking or biting lice that are specific to horses, donkeys and mules. Lice complete their entire life cycle on the horse's skin.</p>  <p>Biting Lice</p>	<p>Biting lice feed on sloughed skin, secretions and hair. Sucking lice feed on blood and tissue fluids. Large numbers of sucking lice may cause anemia and weakness. Infested horses rub, scratch and bite themselves. This is accompanied by hair loss, rough coat, skin abrasions and secondary infections.</p>  <p>Sucking Lice</p>	<p>If you notice rubbing or hair loss, check your horse for lice. Since lice are small and might easily be missed, use a bright light and a magnifying lens to search for them. Long winter-hair coats are ideal for the build-up and spread of lice so most infestations are diagnosed in late winter and early spring.</p>	<p>Lice spread by direct contact between horses or attached to blankets, brushes and other objects used on more than one horse. Treat infected horses with an insecticide. Follow the manufacture's recommendations when applying any insecticide or consult a veterinarian. Apply it to the horse's entire body. Frequent grooming helps to reduce the parasite numbers.</p>
<p>Ticks</p> <p>Ticks are common in parts of Alberta especially where brush growth is abundant. The winter tick (<i>Dermacentor albipictus</i>) is the most common tick.</p>	<p>A severe tick infestation can weaken a horse. In rare cases, they cause tick paralysis.</p>	<p>Ticks are usually found in late winter or early spring.</p>  <p>Tick</p>	<p>It is usually sufficient to remove the ticks manually but topical insecticides can be used.</p>
<p>Mites</p> <p>Mite infestations or mange on horses are uncommon in Alberta.</p>	 <p>Mite</p>	<p>Hair loss, crusting of the skin and severe itchiness.</p>	<p>Have a veterinarian examine any rash to determine if it is a mite infestation or a skin disease.</p>

Table 7
Pests of
horses

Pest

Damage

Control

Flies

Flies may be responsible for disease transmission, blood loss, annoyance, mechanical irritation of the skin, induction of hypersensitivity responses and infestation by larvae of other insects. For most species of flies, a blood meal from a horse serves as a source of protein for egg production by female flies.



Deer flies and **horse flies** cause deep, painful irritating bites and significant blood loss. Blood oozing from the wound attracts other insects. Diseases such as equine infectious anemia are mechanically transmitted by these flies.

Biting midges commonly known as **no-see-ums** or **sand flies** are also major pests. Biting midges often occur in large swarms near their breeding sites. Thousands may feed on a horse each day but you may not notice them because biting midges are small and feed at night. The bites cause intense itching. Allergic skin reactions (sweet-itch) may occur causing the horse to rub and scratch incessantly. These flies transmit *Onchocerca spp.* in horses and blue tongue of sheep.

Black flies cause severe irritation, annoyance and itchiness by feeding inside the horse's ears and on its head, neck and abdomen. Massive attacks by black flies may cause severe blood loss and toxic reactions to the fly's salivary secretion. Most black flies feed outside during the daytime so it is a helpful control measure to keep horses inside during the day.

Horn flies, important pests of cattle, will attack horses pastured near cattle. These flies are associated with the hair loss and crust formation of the ventral midline commonly seen in horses during the summer.

Stable flies attack a variety of livestock including horses. These blood sucking flies feed primarily on a horse's legs and abdomen. Stable flies transmit the horse stomach worm, *Habronema microstoma*.

Both **face flies** and **house flies** feed on eye, nose and mouth secretions. These flies are capable of mechanical transmission of disease-producing bacteria and viruses. Face flies and house flies may be responsible for many of the eye infections seen in horses in late summer.

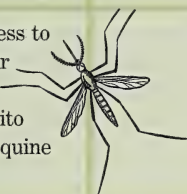


Fly control depends on good sanitation. Remove manure and leftover spoiled feed. Drain stagnant water in corrals and paddocks. Bury dead animals and animal parts. Eliminate weed overgrowth from the horse's environment to lessen larval habitat by allowing air movement and drying. Spray-on and wipe-on insecticides may reduce fly feeding if the owner is diligent in their application. If you do not want to use insecticides, keep flies away from the horse with fly netting – especially face masks.



Mosquitoes

Mosquitoes can cause considerable distress to horses, but their main importance is their ability to act as vectors of equine encephalomyelitis. In years when mosquito populations increase, the prevalence of equine encephalomyelitis increases



INFECTIOUS DISEASES

Risk Factors

The risk factors that govern the incidence of infectious disease in horses are:

- The ability of different organisms to cause disease. Some are much more contagious than others.
- The horse's environment. Horses that are kept at home never contacting other horses are at minimal risk for acquiring the respiratory viruses. Respiratory infection may be very common in young horses that travel to areas such as race tracks and horse shows where other young horses congregate. To a certain extent, you can influence your horse's environment by not shipping it to shows and farms where disease outbreaks are in progress. In reality, however, most horses will travel into high risk areas if they are being used for sport and recreation.
- The horse itself. A horse's susceptibility to a particular disease at a particular time depends on its age, health, and immune status. Modern vaccines decrease the incidence, severity and duration of disease.

Vaccination

An animal that contracts and lives through a particular infectious disease is often resistant to contracting the same disease again. This phenomenon is attributable to the stimulation of the body's natural defence mechanism (the immune system) by the disease organism, thus leaving the animal sensitized to that particular organism. Upon being exposed again to the same organism, the animal or person mounts a fast and efficient immune response that destroys the invader before it can cause disease.

Organisms that are potential invaders can be altered by treating them with formalin, growing

them repeatedly on culture media, by removing fragments of the organisms or various other methods. Such treatments can destroy the organism's ability to cause disease while allowing it to retain its antigenic (immunity stimulation) properties. A vaccination is the administration of such altered organisms or parts of organisms to a susceptible animal. Vaccination exposes the treated animal's immune system to the antigen of the infectious organism but does not infect the animal. If vaccinations have been kept up to date and administered properly, a treated animal's immune system will recognize the disease causing-organism and attack it before it establishes itself and causes disease in the host animal.

An ideal vaccine provides strong prolonged protection, has no adverse side effects and is inexpensive. Tetanus toxoid is a good example of an ideal vaccine. Not many other vaccines provide protection that is as safe, effective, prolonged and relatively inexpensive as tetanus toxoid. The respiratory virus vaccines are examples of vaccines that provide only short term, minimal protection.

Post vaccination reactions may be mild (e.g. fever, depression or swollen, painful injection sites). These mild reactions may concern horse owners and trainers, but most often they are a good sign because they indicate the development of a strong immune response. More-severe reactions may include abscesses, purpura hemorrhagica (reaction that results in blood vessel damage and severe swelling of head and legs) and anaphylaxis (reaction manifested as an acute immediate life threatening situation in which the horse is very anxious, has a very rapid heart rate, is colicky and sweating,

develops severe respiratory distress, collapses and dies within minutes if untreated). These reactions are rare and should not usually be of concern when determining a vaccination program for your horse.

Common Infectious Diseases

Tetanus (Lockjaw) is caused by *Clostridium tetani* bacteria which is common in manure and soil. It can enter the horse through a wound (commonly a nail puncture in the foot). There the bacteria grows and secretes a potent toxin that interferes with the horse's central nervous system. The resultant muscle spasms cause the typical stiffness and "sawhorse" stance which along with a protrusion of the third eyelid are the characteristic signs of tetanus. Tetanus is a very serious disease with a mortality rate of 50 to 80 per cent. To treat tetanus successfully, it must be recognized early and intensive therapy applied.

Prevention – Tetanus toxoid vaccine is safe and effective. All horses should receive an initial two doses three to four weeks apart followed by an annual single booster. Vaccinate pregnant mares one to two months before foaling. This provides passive immunity to the foal through the colostrum (first milk) lasting for approximately two months at which time the foal should receive its initial series of two vaccinations.

Eastern and Western Equine Encephalomyelitis (Sleeping Sickness) are viral diseases of birds, reptiles and small mammals. Infections in these animals are asymptomatic (show no signs). When there is a high level of disease in these animal populations and a large population of mosquitoes, the virus may be transmitted to horses and humans by mosquitoes. These viruses cause disease in humans and horses, which are dead-end hosts. This means the virus cannot be spread from humans or horses to other individuals by mosquitos.

Only western equine encephalomyelitis (WEE) is known to occur in western Canada and it has a

significantly lower mortality rate than eastern equine encephalomyelitis (EEE). Clinical signs of disease include a high fever, depression, sleepiness and lack of coordination. A classical sign is a horse that has apparently gone to sleep with food hanging from its mouth.

Treatment and Prevention – There is no treatment that can be directed against the virus itself, however, good supportive therapy under the direction of a veterinarian can improve the chances of recovery. Horses that recover may have permanent brain damage although complete recovery is possible. To help prevent sleeping sickness, reduce the concentration of mosquitoes and intermediate hosts such as birds, reptiles and small mammals in the horse's environment. Vaccination is a more certain way to prevent infection. All horses should receive an initial two-dose vaccination followed by an annual booster just prior to mosquito season.

Strangles (Distemper) is a highly contagious disease caused by *Streptococcus equi*. Horses become infected through direct contact with other horses that are shedding these bacteria. They may be infected indirectly from equipment such as feeders and waterers that have been contaminated by respiratory tract secretions or pus. In the presence of pus, these bacteria may survive for months.

Post infection nasal shedding is a source of infection. Horses may be asymptomatic carriers (infected animals showing no signs) and remain as an infection source for several months. Introduction of these horses into a susceptible herd may cause a severe outbreak. Infection rates in a herd may vary greatly from 20 to 100 per cent. Mortality in rare instances may reach 10 per cent of affected animals. Affected horses will develop a fever, cough, nasal discharge and will be off feed. Abscesses may develop anywhere on or in the body. The most common site is in the space between the jaw bones in the intermandibular lymph nodes.

Abscessed lymph nodes frequently rupture within 1 to 2 weeks without complication or treatment. Spread of the organism to internal lymph nodes and other body organs is termed

bastard strangles. Bastard strangles cases are more complicated, difficult to treat and have a poorer prognosis. Nearly always, help from a veterinarian is needed when treating **bastard strangles**.

Purpura hemorrhagica is a complication that may arise subsequent to strangles. It is an allergic reaction to the streptococcal bacteria that results in damage to the blood vessels leading to severe swelling forming primarily in the horse's legs. This is a serious disease that requires prompt veterinary intervention and aggressive treatment.

Treatment – Most veterinarians do not treat uncomplicated cases of strangles with antibiotics because once abscesses have formed short-term treatment appears to delay the disease process rather than cure it. Recent information indicates that use of antibiotics, prior to the formation of abscesses, may prevent their formation and stop progression of the disease. To be effective, antibiotic therapy must be continued for more than two weeks.

Prevention – Isolate new horses or horses that may have been exposed to strangles for at least one month before introducing them into the herd. Isolate sick horses from healthy ones for up to three months. During this time, the handlers must be careful not to transmit the disease to other horses on their hands, clothing or other objects.

The manufacturers of strangles vaccines recommend an initial series of two or three injections one month apart followed by an annual booster. This apparently provides some immunity because the incidence and severity of the disease in vaccinated animals are decreased. Outbreaks may occur; however, in vaccinated herds because protection is not complete. To improve results with vaccination, large farms with endemic strangles problems should vaccinate all arriving horses with an initial series of vaccinations. Also, all horses on the farm need to receive a booster vaccination as often as every 2 or 3 months. Before undertaking such a program, horse owners and farm managers should consult with their veterinarian. Because this is an expensive

program, many owners may be deterred by the number of reactions that can occur subsequent to strangles vaccination.

Rabies is an important viral disease because of its public health significance. Fortunately, this fatal disease is rare in both humans and horses. The virus is present in salivary secretions of infected animals and is transmitted through bite wounds. Bats, skunks and foxes are the natural reservoirs of infection. Since difficulty in swallowing may be a sign of rabies, horse owners may be exposed to the virus when they reach into the mouth of a horse that is having difficulty swallowing.

The onset of clinical signs (incubation period) may take from two weeks to several months after initial exposure to the virus. Equine rabies may be difficult to diagnose because of the broad range of clinical signs. Clinical signs observed include depression, hyperexcitability, tremors, spasms, lameness, paralysis, and difficulty in chewing and swallowing. As a rule, affected horses deteriorate rapidly and die within 10 days of the onset of clinical signs.

Prevention – Vaccines are available for horses, but because of the extremely low incidence of rabies in Alberta they are not routinely administered. Rabies vaccine should be administered by a veterinarian. If you suspect your horse has rabies, contact a veterinarian. Rabies is a reportable disease under the Canada Health of Animals Act.

Equine Influenza (the Flu) is a widespread viral disease most commonly seen in populations of younger horses that are congregated at shows, racetracks, rodeos and other areas. Fever, cough, depression, loss of appetite and nasal discharge are common clinical signs of the disease. Factors such as a short incubation period of three days, aerosolization of the virus and spread of the virus via coughing allow for rapid, severe outbreaks of the disease.

The severity of the disease will vary from mild to fatal depending on the age, condition and the immune status of the horse, and the occurrence

of a secondary bacterial infection-causing pneumonia. Several chronic respiratory diseases may follow an influenza infection. One such chronic respiratory disease is chronic obstructive pulmonary disease (COPD), which is a sensitizing of the airway causing a chronic cough and reduced respiratory capacity.

Treatment – Symptomatic therapy (not specific for the virus but enabling the horse to feel better) is all that is available for horses afflicted with flu. Antibiotics are recommended if a secondary bacterial infection is present. Complete rest in a clean, well-ventilated stall with access to good feed and water is very important. Do not put your horse back to work for at least three weeks after all signs of the disease are gone. Wait longer if it was severely affected. Influenza viruses are capable of attacking muscle tissue (including heart muscle). Returning young horses to work too early may lead to chronic muscle or heart damage.

Do not stress young horses by working them while they may be incubating the flu virus. If these horses are in an environment with a potential for respiratory virus infection, take their temperatures daily before working them. Stop the training program at the first sign of a fever.

Prevention – Influenza vaccines are specific to a particular type of flu and only provide protection for a short period of time. Vaccinated horses remain susceptible to other strains of flu that are different from the type present in the vaccine.

To reduce the incidence of influenza in young horses congregating at training stables, shows, and racetracks, administer an initial series of two vaccinations 3 to 4 weeks apart followed by a booster every 3 to 4 months. Broodmares vaccinated once annually in the last month of gestation will receive some protection. What is more important – vaccinated mares will provide passive immunity through the colostrum to newborn foals. Do not vaccinate foals born to vaccinated mares before they are six months of age because their passive immunity interferes with vaccine immunity. Give foals born to unvaccinated mothers an initial series of two

vaccines as early as 2 to 3 months of age. Apply boosters every 3 to 4 months to maintain their immune status. Vaccinate horses that are isolated from other horses (“stay-at-homes”) annually (e.g. 4-way vaccination). However, make sure you have them boosted one month before a show, a trail ride or other such event where they will be exposed to other horses. Discuss vaccination regimes with a veterinarian. Vaccination needs to be varied according to the situation.

Equine Herpes Viruses (EHV)

There are four types of equine herpes viruses. Type one (EHV-1) may cause respiratory disease, abortion, neonatal illness and neurologic (nervous) disease. Type four (EHV-4) produces respiratory disease similar to EHV-1 and may occasionally be associated with abortion. These two types of EHV were previously known as equine rhinopneumonitis. A third type, EHV-3, produces a venereal disease known as coital exanthema. EHV-4 is responsible for many of the outbreaks of respiratory disease in young horses and is indistinguishable clinically from equine influenza. Fever, nasal discharge and a cough are common signs of EHV-4, EHV-1 and equine influenza. Silent infections with no clinical signs may also occur with the herpes viruses.

Respiratory disease caused by EHV-1 may be followed by abortion in pregnant mares, birth of very weak foals or neurologic disease characterized by rapid onset of ataxia (inability to co-ordinate muscle movements) and posterior paralysis.

Prevention – As with other respiratory diseases such as influenza and strangles, isolate new arrivals and sick animals to prevent outbreaks of EHV. In the case of pregnant mares, there is a risk of abortion. Keep them separated from yearlings and horses that are returning from shows, racing and other events where they have been in contact with other horses.

Vaccination can provide a measure of control but not complete prevention. EHV-1 and EHV-4 vaccines provide only short-term immunity similar to influenza vaccines. For young horses

of showing, racing and training age, it is useful to administer a combination vaccine of influenza and EHV-1 and EHV-4 as two initial doses one month apart followed by boosters every 3 to 4 months. Help prevent outbreaks of stress-related respiratory problems by vaccinating foals prior to weaning time.

At the present time, two products (Prodigy and Pneumabort K) are available for use in pregnant mares to prevent abortion. The manufacturers recommend administering vaccine at 5, 7, and 9 months of gestation. Abortion outbreaks have been reported in vaccinated mares but the overall incidence of herpes virus abortion storms has declined significantly since the introduction and use of EHV-1 vaccines.

None of the vaccines for equine herpes virus are believed to prevent the neurologic form of the disease. It may occur very rarely in both vaccinated and unvaccinated horses.

Equine Infectious Anemia (Swamp Fever) is caused by a virus that has the unique capability of infecting a horse for life. Infected horses show one of three clinical syndromes: an acute infection, chronic infection or asymptomatic carrier. Acutely infected horses show fever, depression and loss of appetite within 30 days of infection. A very small percentage of acutely infected horses may die. Horses chronically infected with equine infectious anemia (EIA) show the classic signs of recurrent fever, weight loss, ventral edema and anaemia. Over time, recurring episodes of these signs tend to decrease with more than 90 per cent of these episodes occurring in the first year. Stress may trigger one of these episodes at any time.

Most horses with EIA are clinically normal and never show any signs of disease (asymptomatic). Such infected horses, however, are carriers of the virus and serve as a source of infection for other horses.

The virus is mainly spread between horses by horse flies and deer flies. Improperly sterilized needles, surgical and dental equipment also spread the virus.

Treatment and Prevention – No treatment is available to remove the virus from the horse. There are no vaccines available to prevent the disease.

A Coggins Test identifies, with a high degree of accuracy, horses that have been infected with the virus for longer than 40 days. Identifying infected horses and either destroying them or keeping them in isolation removes a source of infection for other horses. EIA is a reportable disease under the Canada Health of Animals Act.

Equine Viral Arteritis is a viral disease of horses that may resemble equine influenza and equine herpes virus (EHV). Transmission of the virus occurs both through the respiratory route and venereally between stallions and mares.

Clinical signs of equine viral arteritis (EVA) infections include fever, depression, loss of appetite, swollen legs and stiffness, swollen eyelids and underline, nasal and eye discharges and swellings in the skin over various parts of the body. The disease may be so mild as to be unrecognized in the horse or so severe that death results. Abortion outbreaks may occur in pregnant mares.

Blood testing surveys for EVA have shown that it is much more common in some breeds than others. The Standardbred is a breed with a high incidence of positive blood tests for EVA. As with other respiratory viruses, isolate new arrivals and sick animals to prevent EVA outbreaks.

Prevention – A vaccine is available that is apparently effective in preventing this disease. Initially it requires one dose of vaccine followed by an annual booster. Most owners will vaccinate only in the face of an outbreak. Mares being bred to virus shedding stallions should be vaccinated. Some veterinarians may recommend annual vaccination of stallions and mares three weeks before breeding season. Owners should be aware that some European countries will not admit horses that test positive for EVA even if that positive test is as a result of vaccination.

Potomac Horse Fever

Ehrlichia risticii is the causative agent of Potomac horse fever (PHF). This parasite's mode of transmission is unknown. Direct horse to horse transmission does not appear to occur, however, the natural reservoir for this parasite is also unknown. The disease occurs most commonly in July, August, and September and often in horses pastured in river or creek valleys.

Horses affected with PHF may have a fever or signs of colic a few days before developing diarrhea. Diarrhea may be mild or a high volume watery type that quickly leads to dehydration. Laminitis (founder) or abortion may occur.

Diagnosis of PHF is difficult because the clinical signs resemble other diarrhetic horse diseases and currently available blood tests produce both a high level of false-positive and false-negative results.

Treatment and Prevention – Therapy for horses with PHF is based on the use of tetracycline antibiotics, fluid replacement (by oral or intravenous routes) and other symptomatic treatment as deemed necessary by a veterinarian.

Vaccination is the only known method of prevention, however, its protective capabilities are in question. At present, only one strain of *Ehrlichia* is in the vaccine but many strains are apparently responsible for the disease. While not preventing the disease, vaccination may decrease its severity. Current recommendations in endemic areas are for two initial vaccinations four weeks apart followed by annual boosters in late spring (June).

Vaccine Combinations

Many vaccine combinations are available and can be useful for most owners. As a minimum, vaccinate all horses in the spring with a tetanus and WEE-EEE combination (three-way vaccine). For horses coming in regular contact with other horses, administer a four-way vaccine (tetanus, WEE-EEE and influenza) or preferably the three-way vaccine and a combination influenza-rhino vaccine containing flu and both EHV-1 and EHV-4. For susceptible horses, administer a booster of the flu-rhino combination every 3 to 4 months.

For horses that are at risk of Potomac horse fever (PHF) but at low risk of any of the respiratory diseases, a PHF vaccine in a combination with a four-way vaccine is available but is usually administered too early in the season to be effective. PHF vaccine is also available as a single vaccine. Seek veterinary advice before choosing PHF vaccine.

Table 8
Vaccination
programs for
infectious
diseases

Disease	Vaccine	Initial Series		Boosters			
		Adult	Foal	Pleasure	Performance	Breeding	Foals
Tetanus	Toxoid	2 injections 4 weeks apart	2 injections 4 weeks apart starting at 2 to 3 months of age	Annual	Annual	Annual	
Western and Eastern Equine Encephalomyelitis (WEE & EEE)	Killed	2 injections 4 weeks apart prior to mosquito season	2 injections 4 weeks apart starting at 3 months of age	Annual	Annual	Annual	
	Killed	2 injections 4 weeks apart	2 injections 4 weeks apart- if dam was unvaccinated, start at 2 to 3 months. If dam vaccinated, start at 6 months	Optional	Every 3 to 4 months	Optional	Every 3 to 4 months
Equine Herpes Virus EHV-1, EHV-4 Rhinopneumonitis	Killed EHV-1/EHV-4	2 injections 4 weeks apart	2 injections 4 weeks apart starting at 3 months of age	Optional	Every 3 to 4 months		Every 3 to 4 months
	Killed EHV-1					Brood mares 3 doses at 5, 7, 9 months of gestation	
Strangles	M protein/bacterin	Optional 3 injections at 3 week intervals	Optional 3 injections starting at 3 months of age	Optional	Optional	Optional Consider boosting every 2 to 3 months in high risk situations	Optional Consider boosting every 2 to 3 months in high risk situations
	Enzyme extract	Optional 2 injections at 3 week intervals	Optional 2 injections starting at 3 months of age				

Disease	Vaccine	Initial Series		Boosters			
		Adult	Foal	Pleasure	Performance	Breeding	Foals
Potomac Horse Fever	Killed	Optional 2 injections 4 weeks apart	2 injections 4 weeks apart starting at 3 months of age	Annual booster in late spring in endemic areas	Annual booster in late spring in endemic areas	Annual booster in late spring in endemic areas	Annual booster in late spring in endemic area
Equine Viral Arteritis	Modified live	Optional One injection	Optional One injection	Optional Annual	Optional In face of outbreak Annual	Annually in mares being bred to infected stallions Annually in stallions	
Rabies	Killed	One dose	One dose at 3 months of age	Annual	Annual	Annual	

Table 8
Vaccination
programs for
infectious
diseases

(continued)

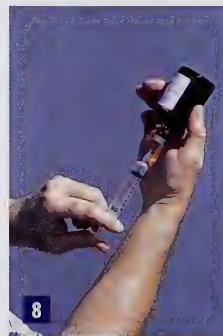
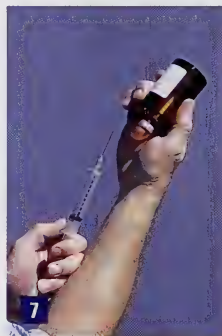
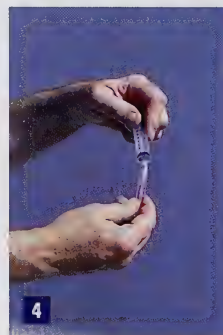
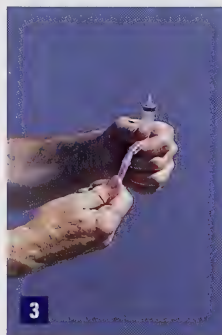
How to Administer an Intramuscular Injection

With the correct technique, you can safely give your horse intramuscular injections. But it is best to have your veterinarian administer intravenous (into a blood vessel), subcutaneous (under the skin) and interdermal (into the skin) injections. Read the product label carefully to make sure it is meant for intramuscular injection.

Remember cleanliness will prevent infections. Keep disposable needles and syringes in their sealed packages until just before using them. Once they are out of the package, do not let them touch surfaces that have not been disinfected.

Figure 11.
Safe handling of
syringe and
pharmaceuticals.

1. Keep the syringe in its sealed packaging until it is used.
2. Remove the protective cap from the syringe.
3. Remove the protective cap from the needle base.
4. Attach the needle to the syringe.
5. Remove the needle tip cover.
6. Withdraw the plunger.
7. Remove the pharmaceutical bottle cap and ensure the top of the bottle has been disinfected before the needle touches it.
8. Insert the needle into the bottle and fully depress the plunger to introduce air into the bottle for ease of withdrawal of the medication.
9. Gently pull back on the plunger to load the syringe.
10. Withdraw the needle from the bottle.
11. Keep the needle capped and clean until it is used.



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Figure 12.
Intramuscular injection sites – the neck is preferred but the rump, hind leg and chest (pectoral muscle) sites can also be used.

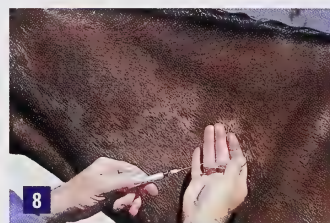
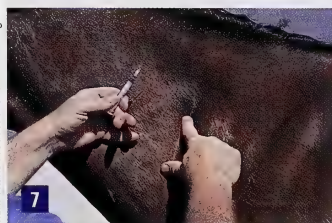
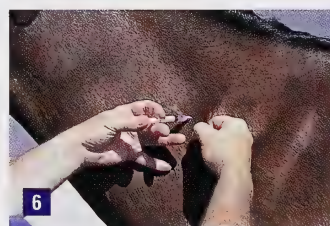
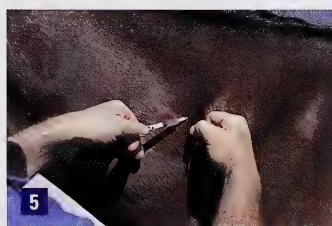
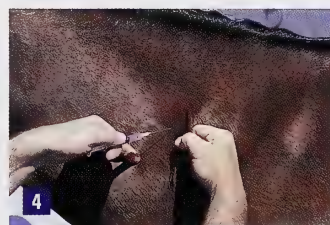
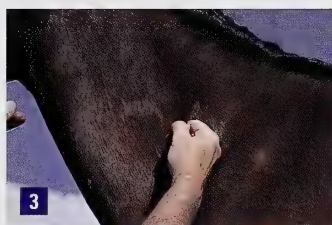
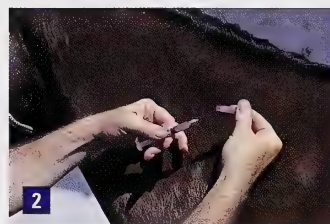
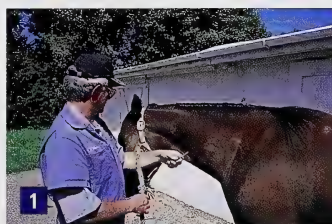


Figure 13.
Intramuscular injection in the neck with needle attached to syringe when it is inserted.

1. Stand facing the rear with the horse to your left. Put the lead rope over your left arm or have another person hold the halter and lead rope as shown in figure 14.
2. Remove the needle cover.
3. Pinch a fold of skin next to the injection site.
4. Insert the needle.
5. Pull back on the plunger to check for blood, a sign the needle is in a blood vessel. If blood appears, remove the needle and try again about an inch away.
- NOTE: Do not inject a product that is meant for intramuscular use into a blood vessel.
6. If no blood appears, depress the plunger steadily to inject its contents.
7. Smoothly withdraw the needle and massage the injection site.
8. Recap the needle.

Figure 14.
Intramuscular
injection in the rump
with syringe attached
to needle after
insertion.

1. Have another person hold the halter and lead rope.
2. Stand facing the rear with the horse to your left side.
3. Detach the needle from the syringe. But keep the case on the needle until you are ready to inject the horse.
4. Remove the needle from its case.
5. Grasp the needle with your thumb and middle finger with its base braced against your index finger and insert the needle.
6. Needle placed in the horse.
7. Attach the syringe to the base of the needle being careful not to wiggle the needle while you attach the syringe.
8. Pull back on the plunger to check for blood. If blood appears, remove the needle and start again at a site an inch away.
9. If no blood appears, depress the plunger steadily to inject its contents.
10. Smoothly withdraw the needle and replace the needle cover.



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COMMON MEDICAL PROBLEMS

Malnutrition

Malnutrition and starvation occur when horses are fed a diet insufficient in either quantity or quality over an extended period of time. This condition may be aggravated by parasite infestation, poor teeth or competition from other horses for feed. It results in a loss of energy stores followed by resorption of body fat and muscle. Muscular power and activity decrease with a loss of body weight that may reach as high as 50 per cent. Recumbency (lying down) and death may occur.

Starvation occurs much faster in young horses and those trying to survive during cold weather. Even a short period of nutritional restriction may stop skeletal growth and stunt a young horse.

Prevention – Starvation is inhumane. Guilty owners should be prosecuted. You can prevent starvation or malnutrition by feeding proper diets, feeding young horses separately from older horses, providing shelter during winter, deworming properly, providing proper dental care and routinely evaluating your horse's body condition. You should also analyze the feed each year and balance your horse's ration.

Teeth

During the evolution of the horse, a diet of grass had a great influence on tooth development. An abundance of silica in grass is capable of quickly wearing out teeth that are not specifically adapted for chewing such abrasive material. In the wild, the lifespan of a horse may be limited by the length of time its teeth remain sound and useful.

As horses were domesticated and confined by humans, their diet was altered by lessening continual grazing and increasing interval feeding of dry hay, grain, processed forages and

concentrates. This dietary change altered the way the chewing system develops, functions, and maintains itself.

An adult horse has six incisors in both upper and lower jaws, and six upper and six lower cheek teeth on each side of the mouth. In addition, male horses have two canines (bridle teeth) in both upper and lower jaws. Approximately 50 per cent of horses will have wolf teeth. These are teeth that were developed in ancestors but are now of little use (vestigial). They occur just in front of the cheek teeth.

Because of the abrasiveness of their food, horses' teeth have very short roots and very long crowns. In a young horse, most of the crown remains in reserve below the gum surface in the bones of the jaws. As the teeth wear down, they continuously erupt at a rate of 2 to 3 mm per year. Old horses have very little or no crown left in reserve. Continuous eruption of the teeth means that if there is any disruption in the integrity of the apposing tooth such as abnormal wear, loss of a tooth or misalignment, then other abnormalities will develop.

A horse's lower jaw is narrower than its upper jaw. The side to side chewing movement of the lower jaw when chewing favours wear of the inside aspects of the upper cheek teeth and the outside aspects of the lower teeth. This results in sharp points developing on the outside of the upper cheek teeth and the inside of the lower cheek teeth. These sharp points may lacerate the cheeks and the tongue resulting in painful chewing and reduce food intake.

The greatest range of side to side movement during chewing occurs in horses on pasture and long stem hay. Horses on pelleted feeds with limited long stem roughage have a reduced side to side movement. This decreases wear of the

molar surface and predisposes the teeth to the development of sharp enamel points.

Treatment and Prevention – Have a veterinarian perform an oral examination and necessary dental work annually. Horses in training on high concentrate diets should be examined every six months. If a horse is losing weight, fighting the bit, chewing abnormally or quidding (spitting out partially chewed food), have it checked by a veterinarian.

The most common dental procedure performed is a floating of the molars. This procedure involves using a metal rasp-type instrument to remove sharp enamel points on the cheek teeth that may be interfering with chewing. Other procedures that may be necessary are the removal of wolf teeth, removal of caps (remnants of baby teeth), removal of hooks from cheek teeth, levelling of the arcade (chewing surface of the cheek teeth) and extraction of diseased or broken teeth.

It is a common misconception among horse owners that only old horses need dental care. Most young horses can benefit from regular dental care. In fact, you can prevent many of the severe problems of older horses by starting lifelong routine dental care when your horse is young (two years old).

Figure 15.
Have a veterinarian
perform an oral
examination and
necessary dental
work annually.



Sharp Shooter Photographics for Alberta Agriculture

Colic

The term colic means that the horse has abdominal pain and is exhibiting signs that indicate such pain. Many reasons exist for a horse to exhibit colic. Various problems such as impaction, spasms (cramps), gas build-up, intestinal accidents (e.g. twisted intestines), foaling or abortion in pregnant mares may cause a horse to exhibit colic. The cause of the colic varies from horse to horse.

If your horse is off feed and lying down at feeding time or it stops eating part way through a meal to lie down, this may be an early indication of colic. The horse may then start to paw, roll, kick at its belly, look at its flank and, if the pain is severe enough, break out in a sweat. Manure production may be decreased, absent or normal. In cases of onset of diarrhea, manure may be increased and very soft and runny.

Treatment – First aid for colic will usually consist of walking the horse. The exercise may alleviate the problem (as may occur with a gas colic). Blanketing the horse is helpful, particularly during cold weather – especially if the horse is sweating. Learn how to take your horse's heart and respiratory rates. Marked elevations of these, such as a heart rate higher than 60 beats per minute and respiration rate greater than 30 breaths per minute are usually signs of severe pain and indicate an urgent need for veterinary care. Horses that are in severe

pain may roll and thrash violently. Beware – you may easily be injured while trying to help a horse that shows these extreme signs. For horses showing violent pain, seek veterinary help as soon as possible. The veterinarian will examine the horse and evaluate its condition. It is best to have the veterinarian administer pain-relieving medication if necessary. In some circumstances, veterinarians may

dispense medication for owners to have available for emergency administration to a colicky horse. Some medications, however, are very powerful and may mask signs that are important for the veterinarian's diagnosis. You should discuss this with a veterinarian.

Depending on the degree of pain (and response to medication), elevation of the heart rate, absence or presence of intestinal sounds, the colour of the mucous membranes (gums), the capillary refill time and results of the rectal exam, a veterinarian will make a tentative diagnosis as to the cause of the colic signs. Horses that are diagnosed as having an impaction will usually receive pain relievers and laxatives (e.g. mineral oil). Those with severe, unresponsive impactions may need intravenous fluid therapy to rehydrate the animal and the impacted material.

Horses suffering from flatulent (gas) colic and those with spasmodic colic may respond to pain relievers and sedatives.

A small percentage of horses with colic will be diagnosed as having intestinal accidents such as displacements of the colon, torsions of either small intestine or large colon, and intestinal incarcerations in hernias or mesenteric tears. In virtually all cases of intestinal accidents, exploratory surgery of the abdomen is required for a definitive diagnosis and possible correction of the problem.

The prognosis for horses undergoing exploratory surgery for colic varies greatly depending on the type of accident present. The amount of intestine involved in an accident and the degree of impairment of its blood supply determine how quickly a horse becomes toxic and shock develops. Sometimes the shock will be irreversible. Other times, the intestinal accident will be correctable but excessive intestinal death prevents access to resect this intestine and euthanasia will be the only alternative. Horses suffering from displacements of the large colon will normally recover completely with correction of the displacement. You must be prepared for a significant financial commitment if your horse needs exploratory colic surgery. It is a skilled and labourious surgical procedure.

Chronic Obstructive Pulmonary Disease (Heaves)

Chronic obstructive pulmonary disease (COPD) may be the most commonly diagnosed condition affecting the horse's lungs. In young horses, allergic small-airway disease may be very prevalent but usually goes unrecognized. True COPD is most common in horses more than six years old.

In young performance horses, subtle signs may only be apparent during exercise when impaired gaseous exchange in the lungs interferes with performance. In older horses, a severe form of COPD leads to difficulty in breathing (especially exhalation), chronic nasal discharge, cough, and even weight loss.

COPD is most common in stabled horses fed hay for long periods of time. Bacterial and viral infections of the lung may result in COPD. Horses continuously exposed to moldy, dusty hay and straw, and housed in poorly ventilated stables are most apt to develop COPD.

Horses exposed to moldy hay and bedding inhale millions of mold spores. Because of their small size, mold spores are able to travel into the deepest areas of the lungs where it is believed they trigger an allergic reaction. **Do not feed heated or moldy hay to horses** because it will cause them to develop permanent chronic lung disease.

Horses with COPD, similar to people with asthma, have bronchospasm (constriction of small airways) and airway inflammation. This causes plugging of their airways with mucous and debris. Horses with COPD have hyper-reactive airways that are sensitive to many non-specific stimuli such as dust, noxious gases (e.g. ammonia from urine) and fungal spores. Thus the COPD may flare up when diseased horses are exposed to aerosolized irritants.

Prevention and Treatment – Some horses respond favourably to medications prescribed for COPD, others only respond while on the medication and still others show no response. A veterinarian can recommend various therapeutic regimens to try until you find one that is successful for your horse.

Management is always an important part of treatment. Horses should live outside as much as possible. Make every possible effort to reduce dust in their environment. Keep stabled horses in well-ventilated areas of the barn. Remove horses from the barn while you are mucking out stalls and replacing the bedding.

With careful observation, trial and error, determine the type of hay or bedding that aggravates the problem. Feeding a different type of hay or using a different type of bedding (e.g. shavings instead of straw) may alleviate the problem in some horses. Some horses respond satisfactorily to replacing loose hay with hay cubes or using a complete feed in place of hay. Other horses will show noticeable improvement when the hay is thoroughly soaked in water for 10 to 12 hours before feeding.

Tying-up Syndrome (Exertional Rhabdomyolysis, Azoturia, Black Water Disease or Monday Morning Disease)

This condition is likely the most common muscle disorder in horses. It frequently interferes with performance in a variety of breeds. Horses that tie-up develop a stiff stilted gait especially in the hind quarters and become very reluctant to move. Severe sweating will occur. Very severe cases may look colicky or may go down. The muscles over the back and hips become firm and painful to touch. Often these signs develop within a **few minutes** of starting light exercise.

Unlike horses with colic, horses that tie-up should not be walked. Walking is very painful for them and may worsen the condition. They should be rested and blanketed. Then seek veterinary advice.

Many factors may cause episodes of tying-up. The classical form of the disease, Monday morning disease, occurs in horses at work or in training that are rested for one or more days while receiving full grain rations. These horses may tie-up as soon as they are started back to work. To prevent this problem, reduce the amount of grain being fed on days off.

Horses that are inadequately trained for competition tend to tie-up – particularly during hot weather. Electrolyte imbalances may cause tying-up. The fact that certain families of horses have a higher incidence indicates a genetic predisposition. Once horses have tied-up they are more prone to recurrences of the condition.

Poisoning

When the cause of sudden illness or death is not readily known, owners often suspect poisoning. Death from poisoning, however, is very uncommon.

Signs of poison affecting the gastrointestinal system may be diarrhea, salivation, and colic. Signs of an affected nervous system may include hyperexcitability, muscular twitching, incoordination, paralysis, coma, convulsions, and abnormal movements and stance. When liver function is affected the buildup of waste products may affect temperament and personality, and white areas of the body may become light sensitive. Other general signs of poisoning are a lack of appetite, dehydration, and depression. Some poisons may cause a lack of oxygen or heart failure resulting in death.

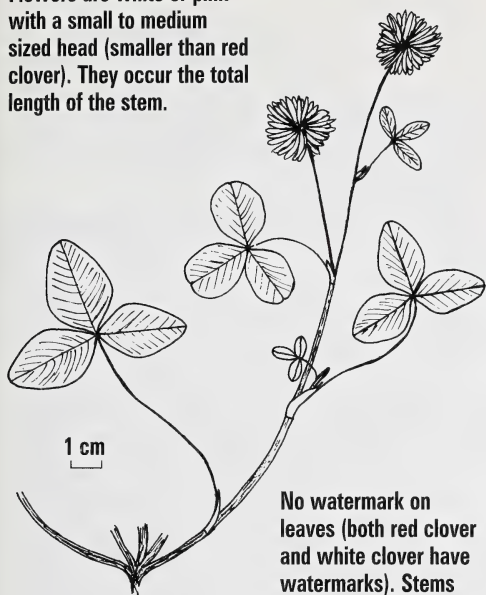
In all cases, careful veterinary examination is required because an accurate diagnosis is necessary. An autopsy may be the only way to make or confirm a diagnosis.

Poisonous Plants

Generally, horses will not consume poisonous plants. If there is a forage shortage or poisonous plants have been mixed with other feeds, they may be forced to eat poisonous plants. Occasionally, mineral deficiencies may cause horses to eat unusual plants.

In some cases, large quantities of a poisonous plant are necessary to cause toxicity. In other cases, only small amounts need be ingested. Some plants that may be toxic to horses are: bracken fern, lupine, locoweed, water hemlock, *Astragalus*, yellow star thistle, yew and horsetail fern.

Flowers are white or pink with a small to medium sized head (smaller than red clover). They occur the total length of the stem.



No watermark on leaves (both red clover and white clover have watermarks). Stems are at least as long as those of red clover but more slender and prostrate.

Figure 16.

Alsike clover may cause liver damage in horses. This may be manifested as primary liver disease or photosensitization. Photosensitization refers to sunburn or damage to unpigmented skin (e.g. blaze, socks) when exposed to direct sunlight. Damage is caused when phyloerythrin is not removed from the blood, which sensitizes tissue and particularly unpigmented skin when exposed to certain wavelengths of ultraviolet light. It becomes activated in the cells that contain the chemical and passes the extra energy to surrounding cells, resulting in their

damage. Some other plants, such as alfalfa, red clover, Swedish clover and members of the St. John's wort family, as well as many chemicals, including medications, may also cause photosensitization.



Figure 17.

Moldy sweetclover hay contains dicoumarol which is an anticoagulant. Like warfarin in rodent poison, dicoumarol will lead to uncontrolled hemorrhaging in affected animals. Early veterinary treatment is required to save these animals.

Ergot is a common toxic fungus contaminant of rye. It is a vasoactive substance that constricts blood vessels resulting in death of such tissues as ears, tail and feet. Do not feed grain containing ergot to horses.

Horses exposed to black walnut (as little as 5 per cent in shavings used for bedding) can develop severe laminitis (founder). This is not normally a problem in Alberta as black walnut is not a native tree.

Foxtail beards and barley beards are not toxic but they can cause considerable mechanical injury primarily by lodging in ulcers in the mouth.

Nitrate Poisoning

Common forage plants may cause livestock poisoning. Oat hay or straw is the most common cause of nitrate poisoning in western Canada. Barley or wheat straw, corn, flax, sorghum, pigweed and lamb's-quarters have been found at times to contain toxic levels of nitrate. Toxic levels may also be found in water.

Environmental conditions such as drought, plant stress (e.g. early frost), rapid growth spurts, herbicides, low light, and fertilization may lead to nitrate accumulation in plants of common feedstuffs. Ruminants, which are more sensitive to nitrate than monogastrics such as horses, may have problems when the nitrate content of total dry matter in the diet is above 0.5 to 1.0 per cent. Although the upper safety limit for horses has not been determined, they are unaffected by nitrate levels that are considerably higher than 1.0 per cent. Forage with high levels of nitrate, can be used for horses if diluted with non-nitrate forage.

It is recommended to have a feed-testing laboratory test annual forages for nutrient and nitrate levels.

Figure 16.
Alsike clover.

Figure 17.
Photosensitization on unpigmented skin on the blaze.

Skin Conditions

Sarcoids

Sarcoids are the most common skin tumours in horses. Sarcoids may spread from place to place on the skin but do not spread to tissues other than skin. Genetic predisposition, skin trauma and exposure to a viral agent may all lead to the development of sarcoids.

The head, legs and lower abdomen are the most common sites for sarcoids but they may occur anywhere on the horse's body. Two types of sarcoids are distinguished, the verrucous (wart-like) type which is usually flat and rough, or the fibroblastic type which has a red surface that bleeds readily and appears much like proud flesh (slightly projecting overgrowth above a healing wound). Combinations of the two types may occur.

Treatment – Most of the verrucous sarcoids are slow growing. They may be left untreated unless they involve an eyelid or some other important structure. The fibroblastic types generally grow rapidly and require some form of treatment. Three common forms of treatment are: surgical removal which is often unsuccessful when used alone, surgical removal followed by cryotherapy (freezing with liquid nitrogen) which has a much higher success rate, and tumour injection with mycobacterial cell wall extract which in some cases produces desirable results.

Figure 18.
Sarcoids are the most common skin tumours in horses.



Figure 18.

Figure 19.
Melanomas shown here: in the skin (left) and a hairless nodule (right).

Melanomas

Melanomas are firm, dome-shaped, hairless grey to black nodules in the skin. They occur most commonly under the base of the tail or adjacent to the rectum and vulva. They may, however, occur anywhere on the body.

Melanomas most commonly occur in grey horses. Eighty per cent of grey horses more than 15 years of age will have melanomas. There is no evidence to suggest that excessive exposure to sunlight increases the incidence of melanomas in horses.

As they age, most horses with melanomas will develop more and more tumours. Occasionally, the size and number of melanomas will interfere with the passing of manure or urine. In some horses, melanomas will spread to other body tissues but this is rare. In most cases, such spread will be fatal.

Treatment – Removal of melanomas will depend on many factors such as the horse's age, and the location and size of the tumour. Consult a veterinarian if you are concerned about a melanoma on your horse.

Warts (Papillomas)

Warts are skin growths caused by a virus. They occur in horses younger than two years of age and are found on the face primarily around the muzzle. They are white or grey firm, protruding masses with a dry, horny surface. Warts are harmless and will regress within 3 to 12 months. They may be removed but it is usually unnecessary to do so.



Figure 19.

COMMON LAMENESS PROBLEMS

Navicular Disease (Syndrome)

Navicular disease is one of the most common diagnoses made in horses with chronic front leg lameness. Navicular syndrome is a more accurate term than navicular disease because the lameness may be caused by pain in the coffin joint, the deep digital flexor tendon, the suspensory ligaments of the navicular bone, the navicular bursa or the navicular bone.

Navicular syndrome is diagnosed from the horse's history, the findings of a clinical examination, response to nerve and joint anaesthesia and radiographic (X-ray) findings. Horses 7 to 9 years of age have the highest incidence of the syndrome but it may occur in three-year-old horses and older. Radiographs (X-rays) are required to diagnose navicular syndrome but it is often difficult to interpret radiographs because the same changes may be present in both lame and sound animals.

Most commonly, this condition is a chronic foreleg lameness that goes unnoticed as it progressively worsens. In the early stages, it improves with exercise. Sometimes it may occur abruptly. As the condition progresses and becomes persistent, it will be worse the day after exercise and improve with rest. In many cases, both front limbs are affected with the lameness being more noticeable in one leg.

Riders often notice the gait becomes shortened and choppy, the horse trips and stumbles, or has trouble turning in one or both directions. Lack of extension of the forelimb frequently leads people to believe falsely that the source of the problem is the horse's shoulder. The lameness is often much more evident if the horse is trotted in a circle on hard ground. Standing with one or both affected limbs advanced considerably



Figure 20. Standing with one or both affected limbs advanced considerably further ahead than normal or alternating one then the other is known as pointing.

further ahead than in a normal stance (or alternating one leg and then the other) is known as "pointing" and is a common clinical sign.

Cause – The cause of navicular syndrome is still poorly understood even though there are many theories. Concussion (pounding), poor conformation, and improper trimming and shoeing may all be predisposing factors. Small feet for the size of the horse, upright pasterns, low under-run heels and a "broken back" foot/pastern axis are all common findings in horses with navicular syndrome. All of these conditions increase either the concussion or the pressure on the navicular bone.

Figure 21.
Correct (left), upright
(centre) and broken
back (right) pasterns.

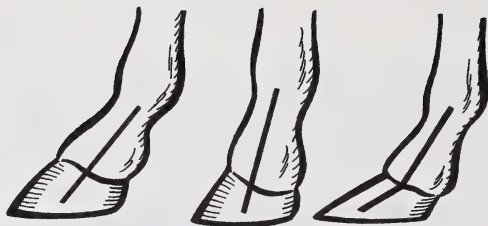
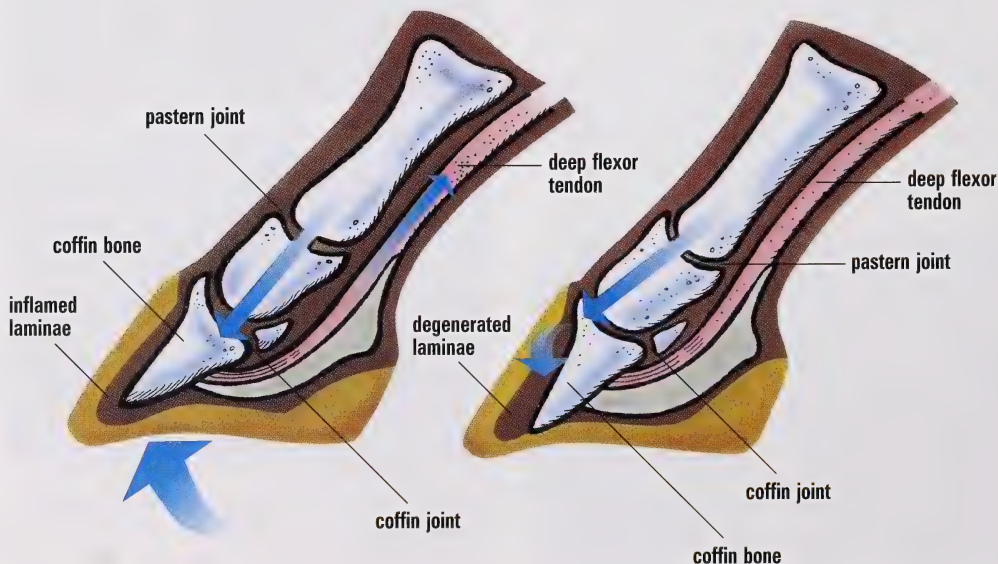


Figure 22.
To prevent navicular
disease, ensure the
shoes extend at least
as far as the back of
the frog to provide
support for the heel.



Figure 23.
Horses with laminitis
have a generalized
metabolic disturbance
that restricts blood
supply by constricting
small vessels in the
laminae. This leads to
inflammation and
eventual degeneration
of the laminae (left).
The coffin bone is no
longer supported and
moves down as it is
pulled back by the
deep flexor tendon
(right). This causes
further loss of blood
supply, lack of
support and pain so
the condition feeds on
itself.



Prevention and Treatment – Work with a farrier and veterinarian to ensure your horses are trimmed or shod every 6 to 8 weeks. Keep the horse's toe short, make sure the foot pastern axis is aligned and not "broken back." Ensure the shoes extend at least as far as the back of the frog to provide support for the heel. Use this technique to shoe a horse with navicular syndrome. It is also the proper way to shoe in an effort to prevent the occurrence of the syndrome.

Laminitis (Founder)

Laminitis means inflammation of the laminae. The hoof wall is a specialized form of skin, as are human fingernails and toenails. It consists of many layers. The outer layers are an insensitive, horn-like material that provides structure and strength. Within this outer covering are deeper layers that serve to attach the outer hoof to the coffin bones and thus support the entire weight of the horse. These layers are the laminae. Inflammation may lead to degeneration and death of the laminae thus destroying the suspension mechanism and allowing the weight of the horse to move the coffin bone within the hoof. A painful crippling lameness results.

Laminitis may occur in any horse that has been sick (e.g. pneumonia, colic, diarrhea, or uterine infection – especially in mares that retain the placenta after foaling). Grain overload (e.g. breaking into a grain bin) or, most commonly in Alberta, an excess intake of lush spring grass can readily lead to laminitis.

Ponies and fat horses with cresty necks are especially prone to founder on green grass but may founder at any time from being overweight.

Horses that develop laminitis have a generalized metabolic disturbance and the laminitis is only one manifestation of the disturbance. The metabolic disorder restricts blood supply by constricting the small vessels in the laminae. This leads to inflammation, swelling and the development of very tiny blood clots in the laminae resulting in its degeneration. The resulting pain causes the release of chemicals in the body that increase the original constriction of vessels. Movement of the coffin bone downward, because of lack of support, places pressure on blood vessels that supply the laminae. This causes further loss of blood supply; lack of support and pain, so the condition feeds on itself. **Very early** intervention by a veterinarian provides the best chance for a reversal of this condition.

Horses with acute laminitis are lame, depressed, off feed and reluctant to move. They may shift weight from one foot to another. One, two or all four feet may be involved. The front feet are most often affected. An acutely foundered horse will place its hind legs well up under its body and move its forelimbs well ahead of normal in order to shift weight onto its hind limbs and onto the heels of its front limbs. The feet will generally be warm and there will be a strong pounding pulse in the arteries leading into the feet.

Treatment – With proper care, some horses will recover almost completely from acute laminitis. Others will recover but with permanent (chronic) abnormalities in the feet. This will limit their athletic careers. Others will require euthanasia for humane reasons because they will be in excruciating, untreatable pain. All



Figure 24.
A horse with acute laminitis will place its hind legs well up under its body and move its forelimbs well ahead of normal to shift its weight onto its hind limbs and onto the heels of its front limbs.

cases of acute laminitis are medical emergencies requiring **immediate** veterinary treatment.

Horses that have survived acute laminitis will have chronic laminitis and may have relapses of acute laminitis at any time. Often chronic laminitis horses have some degree of lameness while abnormal conformation of the foot is always present. The sole is usually flat or dropped, the white line is widened (seedy toe) and the hoof wall shows signs of uneven growth such as irregular rings closely spaced at the upper toe and more widely spaced at the heel.

Radiographs (X-rays) can be used to evaluate the position of the coffin bone within the hoof wall of laminitic horses. Such an evaluation helps the veterinarian determine the severity of the laminitis and make a prognosis for treatment and soundness.

With some veterinary care in conjunction with proper trimming by a competent and knowledgeable farrier, many horses with chronic laminitis are able to lead useful, comfortable lives.

Joint and Tendon Sheath Infections

Lacerations or puncture wounds of any synovial structure (joint or tendon sheath) are potentially serious situations. Invariably these wounds become infected. Synovial infections lead to sudden onset of swelling, with or without drainage and concurrent severe lameness.

Treatment – Prompt aggressive veterinary intervention with flushing (lavage) of the injured structure, the establishment of proper

Figure 25.
Bottom of foot.

drainage and antibiotic coverage are all necessary for successful treatments of such injuries.

Subsolar Abscess (Sole Abscess)

Sole abscesses are the most common cause of acute severe lameness. The lameness may develop in a few hours and be as severe as that of a fractured bone. Heat and swelling are usually present in the lower leg.

Most commonly, a hole or crack develops in the sole and dirt packs into the hole until it enters the sensitive tissue under the sole causing infection. Dirt may enter cracks that extend through the wall or through wide white lines (seedy toe) in horses with chronic laminitis. Nail punctures cause the same or more severe problem, especially if in the mid frog area. In such cases, where the nail penetrates deeper structures, the treatment will be more difficult and the prognosis much worse.

Treatment – Find the abscess, establish proper drainage and keep the area clean until healing occurs. Tetanus prevention is extremely important when dealing with foot abscesses.

Thrush

Thrush is a degenerative condition that occurs in the sulci of the frog. It is likely caused by a bacteria that induces a black discharge with disintegration of the frog tissue, producing an offensive odour. The condition most commonly occurs in horses with contracted heels and excessively deep sulci. If left untreated, the condition may extend into the sensitive tissues beneath the frog. Thrush is more common in horses maintained in wet, dirty conditions.

Treatment – Trim away the affected frog material down to healthy, spongy new growth, topically apply drying agent and keep the foot dry. Depending on the severity of the condition, you may need help from a veterinarian or farrier.

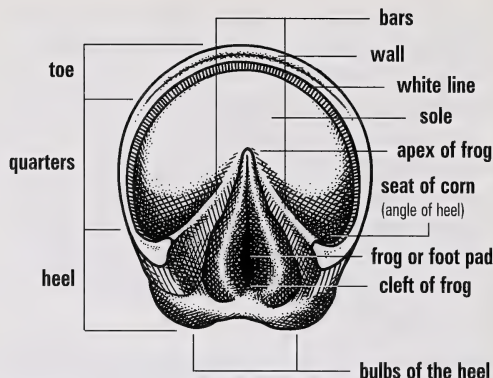


Figure 25.

Tendonitis (Bowed Tendon)

The superficial digital flexor tendon is the most frequently injured tendon in the horse. The injury usually occurs between the knee and fetlock on the back of the forelimbs. Tearing of the tendon fibres with resultant swelling and inflammation produces a bulge in the area. It is this bulge that leads to the term "bowed" to describe this condition.

Most tendonitis occurs in athletic horses that are performing at a high level. The tendon may be overloaded when muscle fatigue occurs at maximal exercise. Poor footing and improper shoeing may predispose a horse to tendonitis. Direct trauma to the tendon or constriction of the tendon may also cause tendonitis.

Swelling, pain and heat in the tendon are clinical signs of tendonitis. Lameness may occur immediately in severe injuries or up to 48 hours later as swelling and compression of the tendon fibres occur.



Figure 26.

Figure 26.
Tearing of the tendon fibres with resultant swelling and inflammation produces a bulge in the area. The bulge leads to the term "bowed".

Ultrasound examination of the tendon is very useful to determine the degree of injury present (fibre disruption and presence of swelling or blood clots) and as a monitoring tool to determine the progression of healing. This enables the owner and veterinarian to make a judicious decision as to when to resume training.

Recovery – Recovery from tendonitis depends on severity of the injury, proper treatment and the intended use of the horse. Many horses will not be able to resume a career as an elite athlete but will be very useful for other endeavours.

Splints

All horses have splint bones, one on each side of all four cannon bones extending downward from the base of the knee (carpus) or the base of the hock. Splints are a reactive condition (periostitis or exostosis) that generally occurs between the splint bone and the cannon bone, usually in the upper third of the splint bone. Splints occur in young horses especially if they are worked hard. They are more common in horses with bench knees or toe-out conformation. The most common site for splints is on the inside of the front legs.

Splints occur because of stretching and tearing of the interosseous ligament between the splint bone and cannon bone. Splints are also caused by direct trauma to the area such as hitting the leg with the opposite foot. This is more common in toed-out horses. Severe trauma to the splint bone can also result in fractures of the splint bones.

In most cases of splints or splint fractures, the initial onset will be recognized as pain and swelling in the area and may cause lameness. In most cases of splints, the splint will become harder and less painful and the lameness will resolve leaving the horse with a blemish that does not interfere with its usefulness. Splints that develop right at the base of the knee may cause problems with the knee joint. Splint fractures tend not to heal and will remain sensitive and active. The lameness will not likely resolve until surgery is performed to remove the fractured fragment. Radiographs (X-rays) are needed to differentiate between splints and fractures of the splint bones.

Bucked Shins

Two-year-old and three-year-old race horses develop the condition in their first year of race training. It is a result of excessive strain to developing bones of horses working at fast speeds on hard surfaces. Usually, both front cannon bones are affected. The initial signs are cannon bones that are sensitive to touch followed by the development of heat and swelling.

Treatment – Mildly affected horses will respond to a reduction in intensity of training. More severely affected horses will require several months rest. If the horse is returned to training too rapidly, the condition may recur.

Sidebone

Sidebone is the term used to describe ossification (turning to bone) of the lateral cartilage of the coffin bone. Sidebone is believed to result from chronic trauma, poor conformation or unbalanced feet. Local wounds may also cause this condition. Sidebone is often an incidental finding on an X-ray exam being done on the feet to confirm another source of lameness. Horses with sidebones are typically lame when going downhill or turning.



Figure 27. Sidebone is a term used to describe ossification of the lateral cartilage of the coffin bone.



Figure 28. In most cases of splints or splint fractures, the initial onset will be recognized as pain and swelling, as shown here below the knee.

Ringbone

Ringbone is the term used to describe arthritis of the pastern joint. Horses with this condition often show a chronic lameness with a thickening that surrounds the pastern joint. The term ringbone is derived from this thickening. Ringbone may occur in either the front or hind legs of horses of all ages. Often it occurs as a result of trauma to the joint. Horses with short upright pasterns or broken pastern angulation are more predisposed to developing the condition. In many cases, however, the cause is unknown.

Treatment – If the pastern joint is severely damaged by arthritis, sometimes the joint may fuse and eventually become sound. Many horses with ringbone will not be useful for athletic purposes unless surgery is performed to fuse the joint (arthrodesis).

Figure 29. Clubfoot usually has a contracted heel and dish shape to the front of the hoof wall.



Figure 29.

Figure 30. Sweeney is a condition caused by atrophy of muscles on the side of the shoulder that results in an instability of the shoulder joint as well as a characteristic hollowness over the shoulder blade.

Clubfeet

The term clubfoot is used to describe a foot with an angle of 60 degrees or more associated with contracture of the deep digital flexor tendon. Clubfeet usually have a contracted heel and a dish shape to the front of the hoof wall. Usually only front feet are involved and one or both may be affected. A horse may be born with the condition or it may develop clubfeet because of trauma or nutritional problems.

With proper foot care, horses with mild clubfeet often can lead useful lives. Moderate clubfeet often require a surgical resection of the inferior check ligament to allow stretching of the deep flexor tendon and consequent dropping of the heel. Severe clubfeet (greater than 90 degrees)

may not respond to surgery and may require euthanasia for humane reasons.

Sweeney

Sweeney is the term used to describe atrophy (loss of function and size) of the infraspinatus and supraspinatus muscles on the side of the shoulder. The condition develops as a result of injury to the suprascapular nerve that passes around the shoulder blade. Most injuries occur as a result of trauma to the shoulder from being kicked or run into a hard object. Ill-fitting collars in draft horses may also cause the problem.

Loss of muscle function results in an instability of the shoulder joint as well as the characteristic hollowness over the shoulder blade. A surgical procedure is now available that releases some tension on the nerve and may allow it to regenerate. Many horses respond well to the surgery.



Figure 30.

Developmental Orthopedic Disease

Developmental orthopedic disease is a term used to describe a package of skeletal problems including physitis, (epiphysitis), osteochondrosis (OCD) and flexural deformities.

Physitis is an inflammation of the physis (growth zone) on the end of any of the long bones in a young growing horse. Suggested causes are:

- Genetic capacity for rapid growth (more common in rapidly growing horses).



Figure 31.

- Genetic predisposition for conformation that puts greater stress on the physis (e.g. upright fetlock conformation).
- Overweight as a result of an excess intake of a high energy diet.
- Growth spurts or compensating growth spurts after periods of skeletal stunting caused by malnutrition.
- Deficiencies of trace mineral such as copper and zinc.
- Calcium imbalance either too high or too low or not in a proper ratio to phosphorous.
- Exercising of young foals on hard surfaces.
- Excessive exercise.



Figure 32a.

Affected horses usually have enlarged hot painful physes. Lameness may be present and flexural deformities (contracted tendons) may develop. Physitis will often respond to proper dietary control and balance (consult a nutritionist).

Osteochondrosis (OCD) may lead to the production of cartilage flaps in the joint, bone cysts adjacent to the joint or bony fragments within the joint. The term refers to a defect that results from improper maturation of cartilage into bone in growing bones. OCD is most commonly diagnosed in young horses beginning training. Joint distension may occur with or without lameness. Although the hock, stifle, and fetlock joints are most commonly affected, any joint may be involved. Frequently the opposite joint is also affected. The causes of OCD are likely similar to those of physitis. In many cases, OCD will require surgery to clean up the joint to allow the horse to perform as an athlete.

Wobbler

Compression of the spinal cord by the vertebrae of the neck results in a neurologic disorder commonly known as wobbler or wobblers. This condition occurs in horses 1 to 3 years old. It may occur suddenly after a fall or it may develop and gradually worsen without any sign of an injury. Instability of the vertebrae in the neck allow the vertebrae to place pressure on the spinal cord when the neck is flexed. The reason for the instability is unknown. It is theorized that a form of osteochondrosis (OCD) may be present in the vertebral joints making them unstable.



Figure 32b.

Figure 31. Physitis is an inflammation of the physis (growth zone) on the end of the long bones in a young growing horse. Shown here in the knees (top) and fetlocks (bottom).

Figure 32. Contracted tendons have developed in these physitis-affected horses.

Horses affected with this disorder exhibit more signs in their rear legs than forelegs. Signs may include knuckling, stumbling, scuffing the toes, crossing over of the legs, interference of legs and abnormal placement of the legs especially when turning.

Treatment – Surgery is available to stabilize the vertebrae and decompress the spinal cord. The procedure is very expensive, however, and has only limited success. Horses with wobblers syndrome do not recover and usually are euthanized because they are unsafe to ride.

Bone Spavin (Jack Spavin)



Figure 33.

Bone spavin is the term used to describe arthritis in the small lower joints of the hock. Arthritis in these joints may lead to bony production causing a hard swelling on the inside lower area of the hock. Most horses with this condition will show a chronic lameness. As with arthritis in any joint, its cause is often

unknown. Trauma, sprains, wear and tear, and poor conformation are often associated with its occurrence.

Bone spavin is more common in horses that work off their rear quarters such as draft horses, dressage horses and cutting horses. Diagnosis is based on a touch examination (palpation) of the bony growth on the inside of the leg at the base of the hock, response to flexion tests, joint anaesthesia and radiographs (X-rays).

Treatment – Some horses can function with bone spavin if properly treated. It is important to seek a veterinarian's help if your horse shows signs of having this condition.

Bog Spavin

This condition occurs in the upper joint of the hock where most of the flexion of the hock takes place. The term is used to describe those horses with distension of the joint caused by excess

synovial fluid production. The condition is rarely associated with lameness. It is usually a condition of horses 1 to 3 years old and often occurs suddenly.

In many cases, evaluation of the joint with radiographs (X-rays) or surgically with an arthroscope will reveal the presence of an OCD lesion (see "developmental orthopedic disease" section). Bone fragments and cartilage flaps of OCD set up a chronic mild inflammation in the joint that results in the production of excess synovial (joint) fluid.

Treatment – Although bog spavin rarely interferes with a horse's usefulness, it often reduces its value for show and sale. Consequently, owners will often request surgical exploration of the joint in an attempt to correct the condition.



Figure 34.

Upward Fixation of the Patella

Fixation of the patella (knee caps) over the medial trochlea of the end of the femur is normally done in the horse to fix both hock and stifle in the extended position to allow the horse to rest by standing hip-shod. This becomes an abnormal situation when the patella remains locked in this position and prevents flexion of the hock and stifle when the horse is trying to advance the leg resulting in the leg being extended behind the horse.

This condition usually occurs in young horses often with poor muscling and poor muscle conditioning of the stifle area. It is more

Figure 33.
Bone spavin is the term used to describe arthritis in the small lower joints of the hock, which may lead to bony production causing a hard swelling on the inside lower area of the hock.

Figure 34.
Bog spavin occurs in the upper joint of the hock.

common in horses with post-legged conformation of the hind legs. Once upward fixation occurs, the ligaments may be stretched so recurrence is common.

Treatment – You may be able to help a horse with a fixated patella by backing it up while at the same time trying to pull the patella toward the outside of the stifle. Often you can resolve the condition with pain relievers and increased training to strengthen muscles. Surgery is available to correct the condition but it should be used as a last resort as recent information associates the surgery with bony changes within the stifle joint.

Stringhalt

Stringhalt may be confused with upward fixation of the patella but it is quite different.

Horses with stringhalt have a problem of over-flexion of one or both hock joints when moving. The over-flexion may be slight or it may be so severe that the foot strikes the belly.

The cause of stringhalt is unknown. It may occur at any time, usually with no other clinical signs. Some cases will develop following severe lacerations to the face of the hock and cannon areas.

Spontaneous recovery rarely occurs. It is possible to correct the condition with surgery but it is only successful in some cases. Severe cases can make the horse unsuitable for work.

Capped Hock

A capped hock is an enlargement on the point of the hock. Almost invariably it is caused by the horse kicking hard objects such as stall walls or trailer doors. Immediate aggressive therapy is needed for the treatment of acutely occurring capped hocks to diminish their size. A significant number of them will remain as a rather unsightly blemish regardless of treatment.

Curb

A curb is a thickening of the back of the leg just below the point of the hock. It may occur as a result of tearing the plantar ligament or the flexor tendon in that area. Curbs are more common in horses with sickle hock or cow hock conformation.

In the acute stage, a curb will be hot and painful and may cause lameness. Most curbs, regardless of the size, will not be more than a blemish.



University of Saskatchewan

Figure 35. Curb is a thickening of the back of the leg just below the point of the hock.

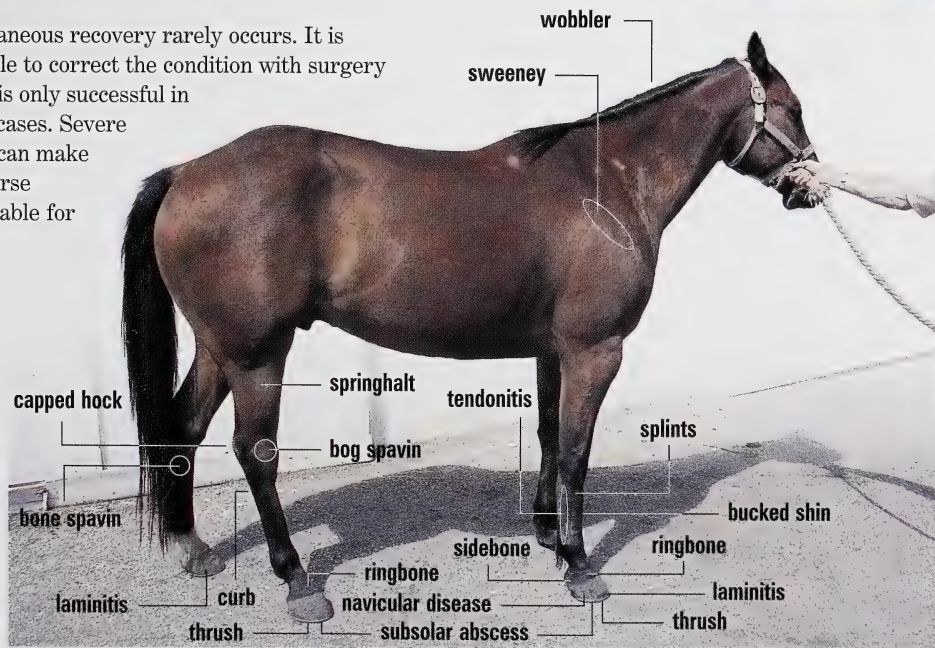


Figure 36. Lameness signs. See following table for details.

NOTE: Shown on a healthy horse to indicate locations of various problems.

Table 9

Lameness signs

Foot Disorders

Clubfeet

- Usually have a contracted heel and a dish shape to the front of the hoof wall.
- Usually only front feet are involved and one or both may be affected.

Laminitis (Founder)

- In acute cases – lame, depressed, off feed and reluctant to move.
- May shift weight from one foot to another.
- One, several or all four feet may be involved. Front feet are most often affected.
- In acute cases, the horse will place its hind legs well up under body and move its forelimbs well ahead of normal in order to shift weight onto its hind limbs and onto the heels of its front limbs.
- Warm feet and a strong pounding pulse in the arteries leading into the feet.

Navicular Disease (Syndrome)

- Commonly a chronic foreleg lameness that goes unnoticed as it progressively worsens.
- Intermittent in the early stages.
- May occur abruptly.
- In many cases, both front limbs are affected with the lameness being more noticeable in one leg.
- Gait becomes shortened and choppy, the horse trips and stumbles, or has trouble turning in one or both directions.
- Lack of extension of the forelimb frequently leads to the false belief that the source of the problem is the horse's shoulder.
- Often much more evident if the horse is trotted in a circle on hard ground.
- Standing with one or both affected limbs advanced considerably further ahead than in a normal stance is a common clinical sign.

Subsolar Abscess (Sole Abscess)

- The lameness may develop in a few hours and be as severe as that of a fractured bone.
- Heat and swelling are usually present in the lower leg.

Thrush

- Black, smelly discharge with disintegration of the frog (foot pad) tissue.

Leg Disorders

Bucked Shins

- Common in 1 and 2-year-old race horses in their first year of training.
- Usually, both front cannon bones are affected.
- The initial signs are cannon bones that are sensitive to touch followed by the development of heat and swelling

Splints

- Occurs in young horses especially if they are worked hard.
- Common in horses with bench knees or toe-out conformation.
- Most common site is on the inside of the front legs.
- Usually the initial onset is pain and swelling in the area and may cause lameness.
- Will become harder and less painful and the lameness will resolve leaving the horse with a blemish that does not interfere with its usefulness.

Leg Disorders (continued)

Tendonitis (Bowed Tendon)

- Produces a bulge between the knee and fetlock on the back of the forelimbs.
- Swelling and inflammation in the area.
Usually occurs in athletic horses.
- Swelling, pain and heat in the tendon are clinical signs.
- Lameness occurs immediately in severe injuries or up to 48 hours later as swelling and compression of the tendon fibres occur.

Joint Disorders

Bog Spavin

- Distension in the upper joint of the hock.
- Rarely associated with lameness.
- Usually affects 1 to 3 year old horses.
- Often occurs suddenly.

Bone Spavin (Jack Spavin)

- A hard swelling on the inside lower area of the hock.
- Most horses show a chronic lameness.
- Common in horses that work off their rear quarters such as draft, dressage or cutting horses.

Developmental Orthopedic Disease

- Usually have enlarged hot painful physis.
- Lameness may be present and flexural deformities (contracted tendons) may develop.
- Most commonly diagnosed in young horses beginning training.
- Although the hock, stifle, and fetlock joints are most commonly affected, any joint may be involved.

Joint and Tendon Sheath Infections

- Lacerations or puncture wounds of any synovial structure (joint or tendon sheath) become infected and lead to sudden onset of swelling, with or without drainage and concurrent severe lameness.

Ringbone

- Chronic lameness with a thickening that surrounds the pastern joint.
- Occurs in either the front or hind legs.
- Horses with short upright pasterns or broken pastern angulation are more predisposed.

Upward Fixation of the Patella

- Patella remains locked in hip-shod position.
- The hock and stifle can't be flexed when the horse is trying to advance the leg.
- Leg is extended behind the horse.
- Usually occurs in young horses often with poor muscling and poor muscle conditioning of the stifle area.

Table 9
Lameness
signs
(continued)

Table 9
Lameness
signs
(continued)

Neck Disorder

Wobbler

- Occurs in 1 to 3-year-old horses.
- It may occur suddenly after a fall or it may develop and gradually worsen without any sign of a problem.
- Exhibit more signs in their rear legs than forelegs.
- Signs may include knuckling, stumbling, scuffing the toes, crossing over of the legs, interference of legs and abnormal placement of the legs especially when turning.

Shoulder Disorder

Sweeney

- Atrophy of muscles on the side of the shoulder results in an instability of the shoulder joint as well as the characteristic hollowness over the shoulder blade.

Other Disorders

Capped Hock

- An enlargement on the point of the hock.
- Caused by the horse kicking hard objects such as stall walls or trailer doors.

Curb

- A thickening of the back of the leg just below the point of the hock.
- In acute stage, a curb will be hot and painful and may cause lameness.
- Usually will not be more than a blemish.

Sidebone

- Typically lame when going downhill or turning.
- Ossification of the lateral cartilage of the coffin bone.

Stringhalt

- May be confused with upward fixation of the patella.
- A problem of over-flexion of one or both hock joints when moving.
- May occur at any time, usually with no other clinical signs.
- Some cases will develop following severe lacerations to the face of the hock and cannon areas.

MISCELLANEOUS CONDITIONS

Umbilical Hernias

Umbilical hernias or ruptures of the navel are common findings in foals. They may be present at birth or develop in the first few months of life. The hernia is recognized as a soft fluctuant swelling of the navel and may be so small as to admit the tip of one finger or large enough to admit 3 or 4 of the examiner's fingers.

Umbilical hernias are of concern for three reasons:

- They are unsightly.
- They are a weak spot on the abdomen which, in case of trauma, provides less protection for the abdominal contents than a normal belly wall.
- A piece of intestine may become trapped in the hernia causing colic, which may be severe if the intestine's blood supply is cut off.

Treatment – Umbilical hernias can be corrected successfully with abdominal bandages, hernia clamps, elastrator rings or surgery. A veterinarian should treat an umbilical hernia because unskilled treatment may worsen the condition by trapping intestine in the hernia.



Figure 37.

Scrotal Hernia (Inguinal Hernia)

Scrotal hernia is a condition of newborn colts. There is an enlarged inguinal ring allowing both the testicle and some intestine to descend from the abdomen into the scrotum. The condition is obvious by the presence of a large soft fluctuant swelling in the scrotum.

Treatment – Some of these colts may require surgery to correct the problem. Others will correct on their own especially if the owner manually reduces the hernia several times daily.

Eye Conditions

The size and location of a horse's eyes make them vulnerable to injury. Eyes that develop cloudiness or are painful, as judged by the horse squinting with its eyelids, require careful examination. Have a veterinarian examine such eyes for lacerations, ulcers, foreign bodies and internal inflammation. These conditions require prompt treatment by a veterinarian. Improper or delayed treatment may result in blindness. Blind horses are candidates for euthanasia.

Blindness may occur in horses for several different reasons. Cataracts are one cause of blindness. If you are purchasing a horse, pay particular attention to its eyes. A complete and thorough pre purchase examination by a veterinarian will include an examination of the eyes.

Figure 37.
An umbilical hernia is recognized as a soft fluctuant swelling of the navel.

Figure 38.
Cold water from a garden hose is useful to cleanse a wound and cool it in an effort to stop hemorrhage.



Sharp Shooter Photographs for Alberta Agriculture

Wounds

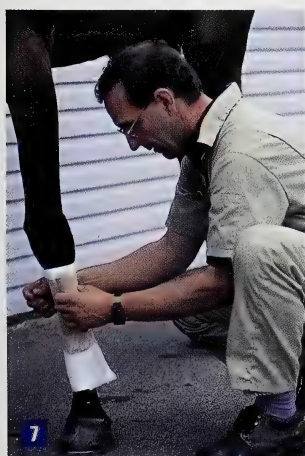
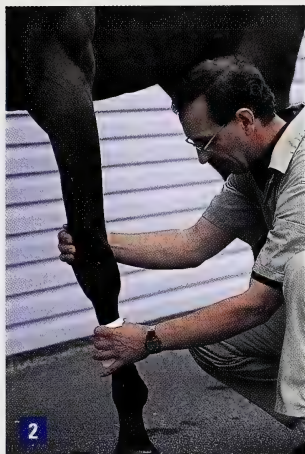
Lacerations are a common injury in areas with barbed wire fencing. These wounds often cause great concern for horse owners. Remember – the first aid principles that are used with humans also apply to horses. Try to calm the horse, apply pressure with bandages, tourniquets or even fingers to stop the bleeding, and apply cold to prevent swelling. Cold water from a garden hose is very useful to cleanse the wound and cool it in an effort to stop hemorrhage.

Suturing wounds – All lacerations of the eyelids can benefit from suturing in an effort to maintain their integrity and function of bathing and protecting the eye. Most other wounds on the face will benefit from suturing in an effort to reduce scarring. If possible, wounds from the top of the knees and hocks down should be sutured, especially if they are longer than two inches, “V” shaped or a flap is present. Wounds on the face of the hock and on the bulb of the heel are not usually sutured unless placed immediately under a cast for immobilization of the area. Casts are also very useful for wounds over the flexor tendons and for large wounds on the front of the lower legs.

Wounds that are contaminated with dirt and debris may not be good candidates for suturing. However, a few days-of intensive treatment with medication and cleansing may prepare those wounds for suturing. Excellent results can be attained with delayed suturing. Have a veterinarian evaluate such wounds and make this decision.

Large chest wounds might not be sutured especially if the wound extends into the muscles. Flaps of skin, however, will need to be sutured or removed. Be assured that the large wounds that may occur on the chest will heal well even without suturing. Other wounds on the body may or may not be sutured depending on their size, depth, the presence of flaps and the amount of contamination.

Virtually all leg wounds from the hock or knee down can benefit from bandaging. Bandages help reduce swelling, immobilize the injury, keep the wound clean and keep antibiotic ointments in contact with the wound. **Wounds do not need exposure to air in order to heal.**



Sharp Shooter Photographics for Alberta Agriculture

Figure 39.
Apply a leg bandage by first wrapping padding around the leg. Keep it flat. Wrap the bandage around the padding. Keep the tension loose enough to allow circulation but tight enough to stay in place.

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